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WORLD
THE NEWS MAGAZINE FOR COMMODORE 64 & 128 USERS

Issue 4
Volume 1, Number 4
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IN REVIEW:
BOCA 144EW
14.4Kbps Faxmodem

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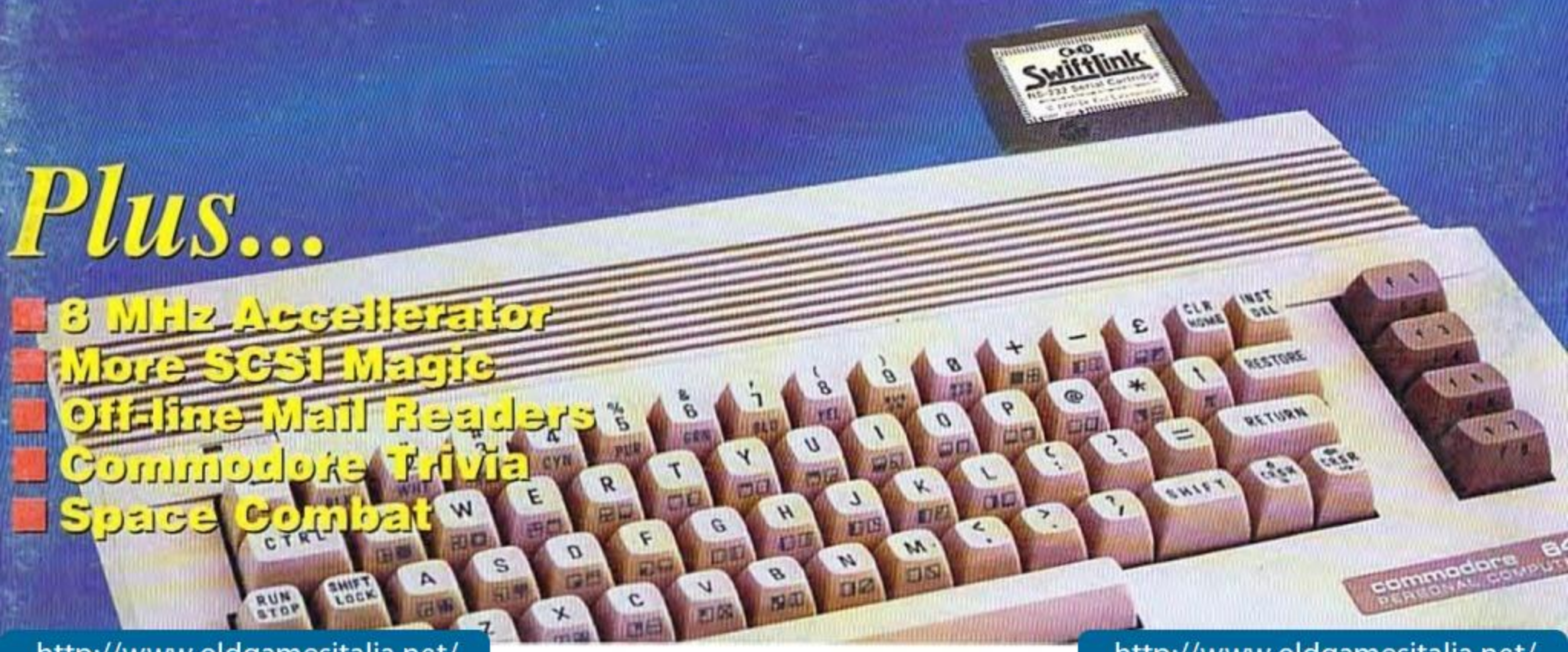

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FROM THE EDITOR...

The ongoing march of the computer industry never fails to amaze, and in many instances, amuse me. Take the recent cover of Computer Shopper, which proclaimed that the Intel-based 486 computers are now obsolete. Ironically, the previous issue of Computer Shopper was urging anyone looking for a new 'PC' to buy one of the new 486DX4-based machines. But with the advent of 'cheap' Pentium-based machines just one month later, if you took the advice to get a 486DX4 then you were already stuck with an 'obsolete' computer. Absolutely amazing.

Meanwhile, I've noticed a lot of Amiga owners on the networks who are now running out to buy MS-DOS machines, and in some cases, Macintosh computers. Apparently they can't deal with being 'orphaned' by Commodore. It seems odd to see that one of the largest discussions in the Amiga area on GEnie is not about a specific Amiga aspect, but on what operating system to use on their newly purchased MS-DOS machine to get the closest possible AmigaDOS look and feel.

The operating system confusion continues. Apple started shipping System 7.5 for the Macintosh, but folks are reporting some problems. That's standard fare for a new Mac System release, and Apple will probably issue a tune-up before long. Chicago, the great new Windows version slated for release in late '94 has been renamed "Windows '95", no doubt to reflect when it will really ship. Leave it to Bill Gates to turn a project delay into a marketing opportunity. IBM's new 'personal' version of OS/2, now called "Warp", has just released, beating Windows to market; yet IBM is still sitting on a warehouse full of PowerPC-based machines, afraid to release them until they have an operating system of their own to ship with them—they sure don't want to give Microsoft more market power by shipping these machines with Windows NT.

Amidst all of this, it seems odd that everyone is fighting so fiercly over the $1000.00 and up market, while everyone ignores the under $1000.00 market that our trusty old Commodore 64's and 128's have had to fill for so many years. This seems even more strange when you look beyond the 'home' market, and consider just how few computers there are to go around in school classrooms. Has everyone forgotten what Apple proved in the '80s with the Apple II? That if you put a lot of inexpensive computers in classrooms, that the home market will be buying them up so that their kids can have a compatible machine to work on when they're not in class? Apparently so.

Well, before I get too carried away on this line of thought, perhaps I should get back on track and tell you about this issue of Commodore World. We've got a pretty packed issue this time, and it took some work to make everything fit. Sadly, we had to drop Over the Edge for this issue; rest assured, it will be back next issue with some interesting commentary on Graphical User Interfaces.

There's a lot of great information on modems, modem interfaces, and on-line services located in this issue's feature; Gaelyne Moranec did an outstanding job in trying to capsulize her wealth of telecommunications knowledge into this article and the glossary of terms which follows it. Jeff Jones penned an interesting piece on the subject of copyrights that presents some information which every computer user should be made aware of. We've also tacked in a small article from Jim Butterfield on what to do about bad file names. Jim will be joining our staff of regular columnists next issue when he takes over our Peripheral Vision column. Speaking of that, Mark Fellows, President of CMD and designer of the CMD HD Hard Drives, has prepared the current column on SCSI device errors that you'll find in this issue's Peripheral Visions. We'll continue the SCSI Magic series next issue, but we'll have to move it to a new column.

There's more trivia from Jim Brain in this issue, and the latest upgrade to Starship Combat; you'll also see a machine language autoboot utility, and a schematic for building an RS-232 interface. News of the Flash 8 accelerator shows up in this issue's Foreign Exchange, and some general info about software comes from Steve Vander Ark in Just for Starters. Steve also begins an excursion into the land of importing and exporting in his Graphic Interpretation column, plus provides us with a review on Fun Graphics Machine. We've got hardware reviews on Boca modems, and more miniviews on some games that are still around. As I said, it's a pretty packed issue, so don't stop here—dig in!

Doug Cotton
Commodore World Editor

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BACKTALK

COMMODORE WORLD READERS SHARE THEIR THOUGHTS

It Just Keeps Getting Better

To Whom It May Concern:

Just got my third issue of your magazine and wanted to express to you how much I enjoyed it. I thought the first two issues were excellent but this last issue blew them both away. It was GREAT!

I really enjoy your keeping us abreast of the things going on with Commodore and all and really look forward to reviews on products. One of the things I enjoy the most is the articles on "Hard Tips". This was one of the things I enjoyed the most with the now defunct Commodore Magazine. I also enjoy the Foreign Exchange section as well as all the other articles.

Congratulations on this fine publication and please keep up the good work.

Sincerely,
Dan Koleski

Bad Internet Connections

Dear Sirs:

I have just received my first issue of Commodore World magazine and it is wonderful. Of course, you guys (and gals) knew that already, so I'll get to the details.

I wanted to offer some insights and critiques on various articles throughout the magazine, while offering some of my own tips. I've enclosed my direct responses to various columns in here; I hope they will be forwarded to the correct departments.

One critique that doesn't look like it belongs under any of the individual sections has to do with the feature article on Internet. The author, while providing a list of the various on-line services that feature access in varying degrees to Internet, fails to mention that both America On-Line and Prodigy are for the MS-DOS/Windows and Macintosh computer platforms only and require specialized software for each machine similar to the way Q-Link is set up for the Commodore machines. Therefore, until either or both services have their programmers write special term software for our Commodore machines (which I don't see happening anytime soon unless the Government intervenes), both are useless for Commodore 64/128 owners (unless they also own one of the above mentioned computers).

Anyway, keep up the great work on CW, and I am looking forward to being a long-time subscriber.

Sincerely yours,
Ray Paternostro, Jr.

Sorry for the oversight. Luckily, we got a second chance, since this Issue's feature talks about on-line services as well. And yes, we remembered.

A Vander Ark Fan?

Dear Commodore World,

Just a short note to say THANKS for a great magazine. Commodore World is the best Commodore specific magazine available today. I've been a long time 128 user, and really enjoy computing on my 128 with GEOS 2.0. I've read Steve Vander Ark's GEOS columns in both RUN and COMPUTE GAZETTE, and was glad to see his Graphic Interpretation column in Commodore World.

Sincerely,
Russ Tahsler

Forget Beginners? NEVER!

First, I want to say how much I admire you folks for embarking on a venture like Commodore World. On the basis of your "Printers" article in the first issue, I purchased an Epson Stylus 800 inkjet printer and am very pleased with the results. I'm anxiously awaiting delivery of Perfect Print and Geocable so I can really put it through its paces. Thanks for helping me keep this machine alive and kickin'.

Finally, several of your readers have made a pitch to gear Commodore World primarily to the experienced user/programmer—since there aren't any new users of the old machines. ***Please! Don't do it!*** I got my C128 from a workmate who'd had it in storage for years. I can't be the only one. I find the machine to be perfect for my simple needs—but I'm learning more about it all the time, and having a great time doing so. Please don't assume that your readers all have 10 or more years of experience with Commodore. That's all, but thanks again for giving me something that I really look forward to every 6 weeks or so. Keep up the good work.

Sincerely,
John P. LaDez

Not to worry, John. We regularly get letters and phone calls from users just getting started on Commodores. Whether they got their machine from a friend, bought it at a yard sale or flea market, or just finally got around to pulling it out of the attic, there seems to be no shortage of new users. And because our market no longer has the luxury of dozens of books on using and programming the 64/128, there's a definite need for magazines such as ours to provide information geared to them.

- Ed.

ERROR CORRECTION

In Commodore World Issue 3, we somehow managed to omit some information about Digimaster in the review. The missing information was the info paragraph which normally appears just before the review text itself. Here's the text that should have appeared:

Digimaster, written by Chris Brenner; $34.95; published by Autumn Technologies and distributed through Creative Micro Designs, Inc., P.O. Box 646, East Longmeadow MA 01028, (413) 525-0023.

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JUST ASKING

THE COMMODORE WORLD STAFF LOOKS FOR ANSWERS TO USERS' QUESTIONS

Q I need assistance hooking up a CBM model 8032p printer that was used with the old PET computers. Also, is there any way to use this printer with GEOS?

Brian Ardoin
DieHard Commodore User

A To attach a CBM 8032 model printer to a Commodore 64 or 128 you'll need an IEEE-488 parallel interface. According to the most recent information I have, the following are still available new from Skyles Electric Works, (555) 555-5555: *IEEE Flash!* [C-64] ($79.00) and *Quicksilver 128* [C-128] ($99.00). I'm not aware of any drivers for GEOS to use these printers. Considering the high cost of the interface you'll need, the inability to use the printer with GEOS, and the overall print quality and age of the 8032 printers, I'd consider picking up a low-cost 9-pin printer instead.

Q I use my C-64 a lot for applications and such. I also love to play games on my C-64. However, after using the joystick for a while, my hand and wrist start hurting. Do you know of a Nintendo-type controller that can be used on the C-64? No joystick, just buttons to press.

David Martinez

A Well, the short answer to that is yes and no. I noticed a tip in a game magazine a few months back that mentioned you can use joysticks for Commodore computers on Sega Genesis game machines. This made me wonder if the reverse was also true. Now, the standard Genesis controller pad has three more buttons than a Commodore joystick, and this fact is what made me wonder if the controller would be a problem to use on a Commodore. Deciding that the worst I could do was blow a fuse, I borrowed a Genesis controller pad and gave it a shot.

It did in fact work—the directional buttons all corresponded correctly, and the B button was equivalent to the standard joystick fire button. But I did notice a problem: part of the keyboard no longer worked when the controller was plugged into joystick port 1. This means that some of the extra functions in the pad are interfering with other lines, and this might cause eventual failure of the I/O chip that controls the keyboard and joystick port.

At this point, I wouldn't suggest using such a controller. However, since controllers like this are relatively cheap and easily available locally, we'll present simple modifications to adapt these for use on a Commodore in next issue's *Hard Tips* column.

Q I use GEOS 128 v2.0 for my business. GeoCalc, geoFile and geoWrite are really great programs for what I need. However, I need a program or patch for geoWrite [128] that will allow multiple printouts. I understand that Perfect Print by CMD does multiple printouts, but only in High Quality mode. I need this for Draft or NLQ modes. There is a program called "WRITEPATCH" on GEnie, but it only works on geoWrite 64. Do you know of a program or patch that could help?

Russ Tahsler

A I believe that there is a desk accessory for printing called TEXTPRINT that will do what you're looking for. You can find the latest version of this on GEnie, file number 14110, filename TEXTPRNTV2.SDA. Since it sounds like you're a GEnie member already, you might ask S.EYRSE who uploaded this file for details. Steve is very knowledgable about GEOS and printers, so he may have other suggestions or recommendations.

Q I have been working in CP/M for some years and own a C128D with PPI RAMDrive and CMD FD-2000, plus two 1571 drives. In the manual for the FD-2000, it states, "CMD is currently looking for a driver or patch that will enable the use of 1.6MB and 3.2MB disks under CP/M." You can of course do this on a CMD HD drive but I was not aware of this at the time or I would have purchased an HD (the price was over [Australian] $1000 at the time).

I know how to patch CP/M with SID or Edfile... so if I was given the patch information and full details of where to install same I could hand the job. Any help you can give me would be very welcome.

Alastair Hay

A Unfortunately, there isn't any solution in sight. CP/M programmers are even more rare than CP/M users, and CMD hasn't located any third party capable of and willing to create the necessary patches.

JUST ASK!

Having trouble getting your system to do what you want it to, or think you've got something wrong with your hardware? *Just Asking* may be able to help find a solution, or get you pointed in the right direction. Send your questions to:

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ON THE HORIZON

COMMODORE AND COMPUTER INDUSTRY NEWS

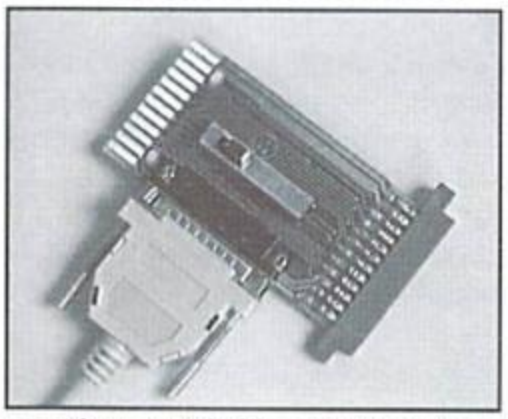
CBM Liquidation Still Unsettled

A full five months after announcing liquidation, the disposition of Commodore's assets remains unsettled. It does appear that the end of the waiting period is in sight, however, as the field of choices has been narrowed to Commodore U.K., and CEI (a Florida-based company). A third company, based in Europe, is reportedly looking into placing a bid, but has not yet done so. At press time, new rumors indicated that the previously private bidding process was now to become public, with one last round of bids to begin immediately. Our sources, however, indicate that this is not the case. Other aspects of the liquidation have also come to light in the past few days, so *Commodore World* will be providing a more in-depth update in our next issue. And, who knows? Maybe we'll even have some clue as to who the next company to ignore us 8-bitters will be.

Grapevine Ceases Operation

The Grapevine Group, well known in Commodore circles as a supplier of both new and refurbished Commodore equipment and parts, recently transferred all remaining inventory to a new corporation, Global Upgrades, Inc. The new company will focus on repairs and upgrades, and also plans to serve as a distributor of parts to other existing dealers and repair facilities. Dealers and other interested parties are urged to contact Global Upgrades for information concerning availability and pricing of equipment and parts. *Global Upgrades, Inc., 121 West Nyack Road, Suite 6, Nanuet NY 10954. (914) 624-3200, (914) 624-3239 (fax).*

CMD Releases geoCable II



The new geoCable II has recently started shipping from CMD. It connects printers equipped with a standard Centronics port to the Commodore 64/128 User port for high-speed parallel printing with GEOS and other geoCable-compatible software. This version of the geoCable provides a switchable pass-through port that allow you to keep another User port device (such as a modem) attached at all times. The switch toggles the User port output between the printer port and pass-through port. To add to the versatility of this device, it uses a standard 'PC' parallel printer cable, which attaches to a DB-25 connector located on the geoCable II circuit board. The standard unit comes supplied with a 6 ft. printer cable, a disk containing GEOS printer drivers, and an installation/user's manual for $29.00. A version supplied with a 15 ft. printer cable sells for $34.00. *Creative Micro Designs, Inc., P.O. Box 646, East Longmeadow MA 01028-0646. (413) 525-0023 (information), (800) 638-3263 (orders), (413) 525-0147 (fax).*

GEnie's Commodore RT Makes Special Offer

The Commodore RT on GEnie is offering $50.00 worth of free services during the first month to new members. In addition to this special offer, the Commodore RT is also sponsoring an upload contest from October 16 through December 31, 1994. The contest offers numerous weekly prizes of free time for weekly winners, plus hundreds of dollars worth of free time and gift certificates to be awarded to the top five uploaders over the length of the entire contest.

GEnie is the official support network for CMD, GEOS, Color 64 BBS, Parsec, plus other companies, software and shareware authors. The Commodore RoundTable provides a vast resource of public domain software, with over 16,000 files uploaded for the Commodore 64, 128, and even the Plus/4. In addition to the file libraries, Commodore users can participate in nightly Real Time Conferences (RTCs), multi-player games, an active message area, special conferences with exciting guests, games, and more. Enjoy the entire breadth and wealth of personal computing with all the news, features, games, information and other special interests available on GEnie.

Founded in 1985, GEnie is an on-line information service consisting of hundreds of RoundTables (RTs) available around the world. Each RoundTable is focused on a specific area of interest such as Commodore computers, IBM computers, cars, movies, family issues, medical, law, military and banking etc.

The monthly subscription fee is $8.95 per month which includes up to four hours of standard connect time usage at 300-1200-2400 baud. Each additional hour is only $3.00 per hour.

For more information concerning rates, local access numbers (including 800 numbers for those in rural areas), additional services and other charges, and to join GEnie, refer to the information below, or call GEnie Client Services toll-free at: 1-800-638-9636.

GEnie Sign-up Procedure:

1. Set your terminal program for half-duplex (local echo) at 2400 baud. Recommended communications parameters: 8 bits, no parity and 1 stop bit (8-N-1).
2. With your modem, dial toll-free in the U.S. at 1-800-638-8369 or in Canada at 1-800-387-8330.
3. Upon connection, type HHH
4. At the U#= prompt, type JOINGENIE and press <RETURN>
5. At the offer code prompt enter DHE524 to get this special offer.
6. Have a major credit card ready. In the U.S., you may also use your checking account number. There is a $2.00 monthly fee for all checking accounts. In Canada, VISA and MasterCard only.
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THE CONNECTION

News from Commodore-related Vendors and Publishers

LOADSTAR

Compression is the encoding of text or data so that it takes up less room on disk in memory, or even in telecommunications. Less space usually equals less money. Anyone who has spent time on-line knows: the smaller the file, the cheaper it is to download. If you spend 8 cents per minute, you want to download the compressed version in ten minutes instead of the uncompressed version in 25 minutes. This is why we ARC, ZIP and otherwise archive files and groups of files.

Advances in both the electronics and compression industries have opened whole new industries. Television and cable will grow because of compression. Your television set "downloads" data from the air and shows it on the fly. It could download a sharper, clear picture, but because of limitations such as bandwidth (and that your TV is designed for a decades old signal) television won't get any clearer without new standards of compression and decompression. Right now some digital cable boxes download, decompress and route hundreds of channels to homes, mainly because of new SOFTWARE, not new hardware.

In layman's terms, compression will fit two or more channels worth of video and sound into one channel. This means your local cable delivery system can deliver more product—and charge you more. As we move to high definition television, the high number of channels available may decrease since high definition means high information.

Frost & Sullivan project that the need to compress motion video is what will spur the expansion of the data compression market to six times its current size by 1999. The market is projected to grow from $101 million in 1993 to 1999 levels of $667 million, at a compound rate of 35 percent. That growth will accelerate because of compression's key role in emerging applications such as video conferencing, digital television, electronic identification systems, desktop publishing, digital cellular, and digital answering machines. Compression squeezes the enormous amounts of data involved in digital video transmission down so it will fit through current delivery channels.

Commodore compression is just as valuable to its users and developers. LOADSTAR is joining the compression craze. Though we're not using anything as sophisticated as MPEG and JPEG, we're compressing our programs as well as our text. As LOADSTAR has grown, so have the programs—there's often no room for everything we want on a particular issue. We began compressing programs long ago, and we're in search of better and faster program crunchers that are transparent to the C-64/128 operating system. Now we've added text to the ranks of the compressed. We can save 35% of the disk space used by documentation and editorials, and route that space to either more text or more programs.

A few issues ago we discussed adding a third double-sided disk to the magazine, which would have been expensive, causing not only production costs to go up, but shipping. With the monthly newsletter we're right on the weight limit now. One more tenth of an ounce and our shipping costs skyrocket.

So beginning with issue #124, we went compressed. Our new presenter will read text from the disk and decompress it on the fly, totally transparent to the user. We thank Gene Barker of Madman Software for the compression scheme.

If any programming wizard out there can create an executable header that could be attached to the beginning of .ARC and/or .LZH files that will self dissolve and RUN programs packed with ARC250, please create it and submit it to LOADSTAR; we'll pay you for it. This product would be essentially an SDA module that writes to memory instead of disk, then RUNs the program. The module should NOT use important vectors and zero page locations, leaving the OS quirky and buggy. If it does use zero page extensively, it should repair it afterwards. We'd also be interested in a BLOAD tool that would LOAD individually ARCed files into memory and decompress them to other areas of memory. These would be extremely valuable tools for programmers—and LOADSTAR.

- Jeff Jones
Associate Editor, LoadStar

CEE-64 Alive!

In the last month or so, I've been taking a look at the support available for our Commodores, and in all honesty, I'm overwhelmed. When companies such as Creative Micro Designs, CEE-64 Alive!, Loadstar, dieHard, etc., have employees that put in well over 12 to 14 hour days working strictly on -- products, it's a good sign that our computers are doing well, and in fact, thriving.

Last night, I spent two or three hours attending a conference on GEnie with Doug Cotton and Mark Fellows as the guests. I logged off sometime around one o'clock in the morning, and although I work "third shift" on CEE-64 Alive!, I had to wonder how Mark and Doug (who had already put in very full days at CMD) could manage to stay awake and alert after such a long day. The questions asked of them weren't necessarily easy ones to answer, either. I found that even I was worn out afterwards!

I've just finished putting the final touches on CEE-64 Alive!'s latest issue, and I'm still on the natural "high" I get when I finish an issue, so it seems the perfect time to write my column for Commodore World. Actually, that's the excuse. The truth is, this column is the last item on my "Get This Done or ELSE" list, and soon as I have this slashed off, I can go play. I have great plans to load up The Fun Graphics Machine and create a few masterpieces. Once these are done I'll load up my term

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program and go check out my favorite bulletin boards.

This is yet another thing I find amazing about those of us who spend our "working days" using our Commodores—we rarely seem to tire of them, and when not doing something that could be called "work", we're often times found "playing" using the same computers! Then again, if caught doing something "fun", I can always use the excuse that I'm checking it out for the magazine. Sometimes, I even get away with it...

Goodies packed into Issue #4 include a shareware program on our newsletter disk called EZ Loader, which makes loading program from any disk drive or other device very easy, a demo of a new game, Phil Heberer's soon to be famous GEOS Cheesecake, and Jack Vander White has resumed his popular BASIC programming column again. Oh, and of course we have a ton of information in our littlebits and other bits columns this time around.

- Gaelyne Moranec
Editor, CEE-64 Alive!

dieHard

Hi, I'm Jerry Hill and you've never heard of me. I'm the new Associate Editor here at dieHard. That means I get to do all the stuff Brian doesn't want to. That also means I get to let you know a little bit about the October issue of dieHard as well as let a few of my personal skeletons out of the closet. The October dieHard is a caldron bubbling over with programming spells like Popcorn 64, an interesting little bite of high-tech HIRES, and Random Music for the VIC 20, sure to generate a few shrieks and wails (probably from your family)! Our feature spells this month deal with "Grappling the Great Gooey", an in depth series on GEOS for beginners, and "Exterminating the 1541/71 Relative File Bug". Throw all of our regular features into the brew and you've got the makings of a fine Halloween treat. Top the whole thing off with some great digitized Halloween graphics and a handful of Print Shop graphics and commodore just might come back from the grave to see what we've done with their machine! Some of you may know me a little from Q-Link (RIP!) or GEnie as Animal6 or Animal. Maybe not. Most of my BBSing was done locally in the Tacoma/Seattle area until Brian lured me to Boise with the promise of getting paid to play with commodores. I hope to be spending a lot more time on GEnie and Delphi so I can stay in constant touch with the telltale heartbeat of the commodore nation. I bought my first commodore 64 in 1988, hooked it up to my little black-and-white TV, and started using GEOS with one disk drive! I bought a printer for our second wedding anniversary. My wife still hasn't forgiven me for that, even though the printer helped her through college. I've had just about any job a guy could have and I must say I never dreamed I would get to turn my hobby into a publishing job. I suppose that's enough about me. Maybe I'll be back again next month (if Brian lets me out of my cage!). Until then, never let the monsters gain on you and always be a dieHard!

- Jerry Hill
Associate Editor, dieHard

FUN GRAPHICS MACHINE

Last month we jumped into FGM's LINKED SCREENS. You can work on and print two or three screens across/down without linking, but it's a whole lot easier if you link the screens and use them that way. Linking the screens is provided to make FGMing easier, not to complicate it.

When screens are linked two-across the third screen in memory is available to use as a work space, or as a backup/oops screen. You can COPY (pg. 18) one of the linked screen areas to the third screen, safely make changes to it there, then COPY or TRANSFER it back to the linked screen area. Or, you could load an s. screen file to the third screen (perhaps fonts or graphics).

To COPY a linked screen area to the third screen, use this process:

1. Press SHIFT X to go to the third screen.
2. Clear the third screen (SH CTRL E). This is vital; COPY must find a clear screen area to copy to. NOTE: If any other screen is also clear place an x or something on it, else COPY may place the copy there instead.
3. Press x to go back to the linked screens. Continue pressing x until the linked screen area you want to COPY is visible.
4. Press c. The screen should reverse/unreverse to indicate that the screen has been copied.
5. Press SHIFT X to go back to the third screen.

To COPY the third screen back to the linked screen area, clear the linked screen area where you want the third screen to go, then go to the third screen and press C. Or, use GRAB (pg. 23), TRANSFER (pg. 44), or ADJUST's CAPTURE (pg. 41) to move selected areas of the third screen to the other screen areas.

Now let's touch on down-linking the screens. When you down-link the screens you'll have three single screens "stacked" one over the other. Margin and wordwrap are available. One important use for this would be if you wanted to do a column for a newsletter. When you save down-linked screens FGM uses the third character in the filename as a key to its location (see pgs. 13-14). If you give a filename of "s.a1 cats", when you go to save down-linked screens the program will save the second screen as "s.b1 cats", and the third screen as "s.c1 cats".

OK, let's say we want to do two columns, each three screens down. When you go to save the second column of screens, use a starting filename of "s.a2 cats" and the program will save the three screens as "s.a2 cats", "s.b2 cats", and "s.c2 cats". Now, remember back to last month; the fourth character is the key for across-linked screens. Not only have we saved two sets of three down-linked screens, but we have named in a way that they're also across-linked; if you press / and link the screens two-across you can load the two top columns by giving a filename of "s.a1 cats"; "s.a2 cats" will also be loaded. The above could be extended for three columns; use a starting filename of "s.a3 cats" for the third column of down-linked screens.

NOTE: When doing columns be sure to set the margins (pgs. 32,50) so there's some space between each column, else they'll run together. If you want lines between columns place them outside the margins.

What if you wanted four screens down? Three screens down will only print 8.3" down a sheet of paper (three screens equals 75 rows, most printers print 9 rows per inch, so 75/9=8.3"). Ninety rows will print ten inches down. For that you'd only use fifteen rows of the fourth screen (90-75=15). To figure how many rows for a given length simply multiply; inches X nine. Divide the result by 25 for how many screens you'll need.

There are several ways to do the fourth screen. My recommendation would be to down-link the screens (so you have margins and wordwrap), do the single screen, then save the screen UNLINKED. When you go to save you're prompted SAVE LINKED YES/NO if screens are linked. If you answer NO then you'll be prompted to select the one screen you want to save. Do that, then enter a filename of "s.d1 cats" for the first (left), "s.d2 cats" for the center (second), or "s.d3 cats" for the third (right) column.

Next issue we'll get into whatever area of FGM I get the most requests for. Until then, Happy Computing...

- Ron C. Hackley
Co-Owner, FGM Connection

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TOP TIPS

THREE HELPFUL TIPS FROM A COMMODORE WORLD SUBSCRIBER

Leave the Switches Alone...

It seems that a lot of Commodore owners who own non-Commodore printers with interfaces in the middle tend to set their dip switches to the transparent mode for printing from commercial programs, and switching them back to CBM emulation for printing from BASIC and small ML programs. Since most good programs allow the users to select a secondary address, and all interfaces have one or two secondary addresses for transparent mode, changing the switches back and forth is totally unnecessary. Simply put the interface into CBM emulation mode and on the commercial programs, select the secondary address for transparent mode (4 in most cases). While GEOS does not allow the user this option, it uses secondary address #5 (transparent with no added linefeeds) which is compatible with most printer interfaces (except the Tymac Connection).

- Ray Paternostro, Jr.

Printer Interface Power Tip

Most interfaces have an extra wire going to the cassette port for the +5V they need to function. On many printers, this power is also offered on pin #18, so it is possible to modify the interface to draw its power from the printer instead of from the computer. Simply solder a small wire on the interface circuit board connecting the pin #18 point with the point that the cassette wire goes to. (For interfaces that have a cable going to the printer connector, a continuity tester is extremely

helpful.) Since not all printers supply this voltage, it would be helpful to determine if the voltage is present on the printer connector before attempting this modification. To do this, turn the printer on and *very carefully* use a multimeter set for DC volts on pins #18 (positive) and #16 (signal ground) for +5V. Be VERY careful not to touch the probes on the adjoining pins! If you are not comfortable with this type of work or don't have easy access to the equipment mentioned, someone in your local users group probably does. Also, I know for certain that printers by Star Micronics and Panasonic do have the necessary power on the printer connector. When this is done and the printer is working, the cassette wire can be removed from the serial connector.

- Ray Paternostro, Jr.

[Editor's Addendum: If you own a Micrographics MW-350 printer interface, it already has this function built-in. Also, years back, after writing a review for the (at that time) new Cardco G-Wiz printer interface and recommending a similar modification, I received a letter from Cardco concerning this. They warned that some printers that supplied power on pin 18 of the Centronics port may not have ample reserves to power Commodore printer interfaces, since the interfaces themselves generally do not use low power circuitry. We feel obliged to pass on this warning, even though we've never encountered a problem with this ourselves.]

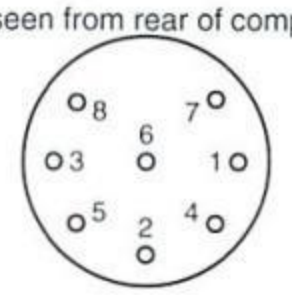
Better Video Tip

Commodore 64 and 128 computer all have what is referred to as the composite video connector on the back which is used to connect a video monitor. However, many 64/128 owners who are using a Commodore monitor are not getting the best picture possible if they have an aftermarket video cable going from the computer to the monitor. The video connector offers both composite video on one pin, and the Chroma and Luma signals (referred to as separated/LCA video) on two other pins. Every aftermarket cable I've seen only has a five-pin DIN connector which utilizes the composite pin, sometimes the Luma/Sync pin (which gives a black and white picture if hooked up to [the] composite video jack on a monitor/VCR), but never the Chroma pin. Compounding the problem is [the fact] that the eight pin DIN jack used for composite video is not a standard jack; the top two pins are spaced farther apart, preventing a normal eight pin DIN plug (Radio Shack #274-026) from fitting it. The solution is to cut off/pop out the top two pins since they are not used and after removing the five pin DIN plug from your video cable, solder the wires into the appropriate pins. The diagram below is from the C128 System Guide.

- Ray Paternostro, Jr.

C128 Composite Video Port

(as seen from rear of computer)



Pin	Definition
1	Lum/Sync Output
2	Ground
3	Audio Out
4	Composite Video Out
5	Audio In
6	Chroma (color) Output
7	Not Used
8	Not Used

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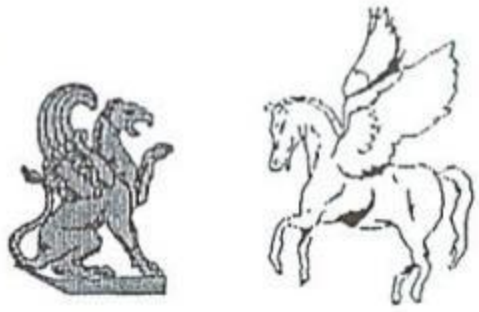

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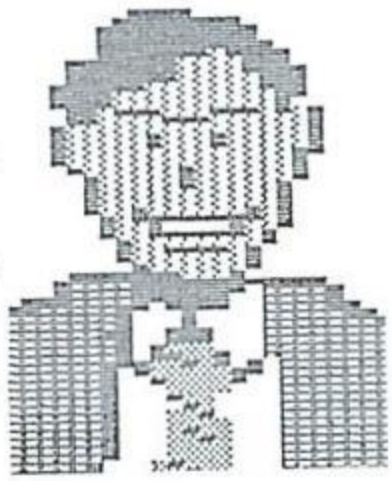

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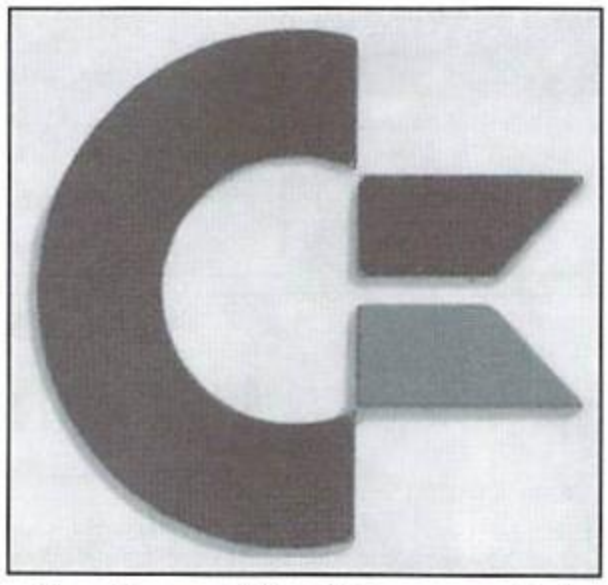
Just For Starters

by Steve Vander Ark

SOFTWARE: WHAT YOU BOUGHT YOUR COMPUTER TO USE

Last issue we talked about disk drives. I said then that you would more than likely want a disk drive because virtually all Commodore software comes on disks. If you want to run any software, then, you need a disk drive. There are exceptions—I own a few games on cartridges, for example—but these are rare. As I described the way a disk drive works, I talked about a certain type of program called a *word processor*. A word processor is one type of software program you can buy. There are many other types, and in this issue I'll mention some of the most common and tell a little bit about what they do.

Before I do that, however, let me define a few terms. One that I have already been bouncing around quite a bit is *software*. Software is a fancy name for a program that you run on your computer; the word usually refers in general to the program, the disk it comes on, and any paperwork that also comes in the package. If someone says that they're using GEOS software, for example, that means they bought and are using the package called GEOS, which includes several disks and a hefty manual in a box. The program itself, (a program, as I mentioned last issue, is a list of instructions for the computer to do a particular job), is recorded on the disks. In the case of the GEOS software, there are many more than one single program, and that's often the case. The word software refers to the whole business. Software is the opposite of *hardware*, which is a general term for all the equipment you are using. The monitor is hardware, in other words, as are the keyboard and the disk drive. When you use a computer, you'll be using both hardware and software.



There is a word for all the paperwork that comes with a software package, whether that's a large manual such as the one that comes with GEOS or a single Xeroxed page, as is the case with The Blues Brothers game. This is called *documentation*, and good documentation is important for anyone who is planning to use any particular software package. That's because the documentation tells the user how to work the program: how to start it going, how to make various things happen, how to save any data the program creates, and so on. Obviously, the documentation can make a big difference in how easy and pleasant a software package is to use.

There are basically two types of software for computers. The first type is *entertainment* software (games, in other words) and the other is *productivity* software. When you bought your computer, you probably had in mind one or the other of these types of software. You wanted to play some exciting computer games, for example, or you wanted to use a spreadsheet to help organize your finances. Chances are you will actually do some of both, but deep down your real reason for needing the computer was either to be entertained or to do work. Now you need to consider what kinds of software to buy to get your computer doing what you want it to do.

Game software is a general description for a lot of types of computerized entertainment. Which kind you buy will depend on what you like. I happen to like role-playing games like the Bard's Tale series or the AD&D games from SSI Inc. My daughter, on the other hand, prefers arcade games like the Blues Brothers game I mentioned a minute ago. My wife is a fan of strategy games like Quink or Swap, or word games. There are a lot of games which call themselves educational, and that usually means that they drill the player on some kind of factual knowledge or skill as part of the game; they can be arcade games, role-playing games, or strategy games. Whatever your preferences, you'll find a game or two to keep you happily glued to the monitor screen.

Here are a few more things you should know about game software:

- A lot of games require a joystick, especially the arcade titles. You can use a joystick from an old Atari video game, if you have one, or buy one from a mail order firm. Make sure you get a Commodore-compatible joystick. A mouse can be used in joystick mode, although many games don't play very well that way.

- Some games, particularly the role-playing games, ask for a blank disk to store game information on. That way you can start a game

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"PLAN ON KEEPING A SET OF DISKS TO HOLD THESE FILES AND ORGANIZE RIGHT OFF THE BAT"

from where you left off or go back and start from the last time you saved the game if you get crunched (a nice feature for lame gamers like me). They may want you to have the disk already *formatted*, which is something I'll talk more about next issue.

- Generally speaking, you shouldn't remove a disk from the disk drive unless told to by the program. Most games use files from the disk every so often and if you've removed the disk, the game will not be able to keep working.

For a lot of people, myself included, games take a back seat to productivity software. Productivity software includes a lot of different packages which are tools to get work done. The word processor is a good example of a common productivity software title. With a word processor, you can create any kind of text, form a short note to a long article or book, entirely on the computer screen. Only when the text on the screen is edited and correct do you print the whole thing out on a printer. Word processors are probably the most popular productivity programs around.

The database is another example of productivity software. With a database program, you collect pieces of information, such as names and addresses, in a form that the computer can look through easily. You might put those names and addresses into a database, then use the computer to look through the list for a specific name. The big advantage of this instead over, say, an address book, is that the computer can look things up very quickly and efficiently. You could ask the computer to look up someone with the first name of Mark, for example, and it would do that even though the database kept the information in alphabetical order by last name. You could also ask the computer to look up two things at once, such as finding anyone named Mark who also happens to live in Grand Rapids, Michigan.

A third common type of productivity software is the spreadsheet. A spreadsheet is kind of like a fancy calculator. The display of a spreadsheet looks like a bunch of boxes or a grid. You type words or numbers into the spaces, then tell the computer to fill in another space with the results of some math function using the other numbers. If that was too confusing, try this example. If you wanted to keep track of expenses for your computer system, you could set up a spreadsheet program with spaces for all your different purchases. You can even make spaces for things you haven't bought yet. As you spend your money, you enter the amount spent into these spaces. Somewhere on the spreadsheet you'd set aside a space to show the running total of all the spaces. This number will change as you add or adjust the numbers in the other spaces. You could even create a space to subtract that total from a preset amount that you've budgeted for your computer, thereby letting the spreadsheet tell you how much you have left to spend.

Part of the power of a spreadsheet is that you can use it to try out various options or "what if" scenarios. In your computer budget spreadsheet, for instance, you could enter various prices for monitors, comparing the grand totals for each one, to help you make a decision about which to buy. This kind of power makes a spreadsheet a must for anyone who works with numbers.

Here's a few more things worth noting about productivity software:

- Whereas most games use the joystick, most productivity software uses the keyboard or (even better) a mouse.

- Most productivity software is going to create data: word processing documents, databases, spreadsheets, and so on. Plan on keeping a set of disks to hold these files and organize right off the bat. It's much easier to save things to the right disks now than to sort them all later.

- Make sure you know what you hope to accomplish before you buy the software. A great-sounding software package might not really be able to do what you need it to.

- Back up your data often. This means that you should make copies of your data disks regularly. Next issue we'll be talking more about the disk commands that will help you manage your collection.

Software for the Commodore is not always easy to come by. There are some excellent companies out there still carrying software titles in all these categories, however. Commodore-specific magazines like *Compute's Gazette* and *RUN* have published a lot of great programs over the years in all categories. You can even get programs for practically nothing from on-line services such as GEnie. Before you buy a program, though, try to get an opinion from another Commodore user. A wonderful place for that kind of interaction is a Commodore *user group*, which is what computer clubs are called. Check a local computer store for information about any local groups that support the Commodore computers.

Next issue, as I said, I'll discuss some of the most often used disk commands you'll need to handle your collection of disks and the files on them. Until then, have fun with your Commodore. If you'd like to reach me, write to me in care of this magazine; for a quicker response, you can email me on GEnie by sending mail to S.VANDERARK or on the Internet by sending your mail to:

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Foreign Exchange

By Joseph Gaudl

FLASH 8: GERMAN HI-TECH FOR THE COMMODORE 64

We should all be shouting: "Stop the presses! The FLASH 8 miracle module has arrived!" Surely something as spectacular as a piece of hardware guaranteed to pump your C-64 up to 8 Megahertz should demand front page status. I write this month's *Foreign Exchange*, however, with a bit of hesitancy. It's not due to the fact that the thing doesn't work. It does work, and work rather nicely at that. It's just that FLASH 8 had been hyped for so long over here in Europe, then trashed, then hyped again; shortly after that it disappeared again when the manufacture declared bankruptcy, then resurfaced with another company and on and on and on. Many of us snickered when *64'er* magazine announced a FLASH 8 test report in their July 1994 issue. The test results were very good, and we were pleasantly surprised! Before I give you a rundown on what FLASH 8 can and cannot do, though, let me give you some background information on the development of the card.

The German based hardware company, Roßmüller Handshake, was rather active in the Commodore 64 market before leaving for the then lucrative Amiga market in 1992. Roßmüller was later approached by the editors of *64'er* magazine and asked if the company could develop a card for the C-64 which would increase it's processing speed. Roßmüller agreed to give it a shot, and got back into the C-64 hardware business. In the late summer of that same year the first prototype was sent to *64'er*. The card showed great promise, but had many flaws. When the editors questioned Roßmüller about these flaws, they were told that it would only take a few weeks to resolve them. Roßmüller then started a very expensive advertising campaign of full page ads in German computer magazines, which abruptly came to an end in February 1993. While all of Europe waited for "The Card", Roßmüller was obviously stalling for time and apparently having serious financial problems. The company was bombarded with letters and calls from user groups, individuals, and software and hardware companies who wanted or needed information on FLASH 8's progress. Some poor souls had even ordered and paid in advance to insure getting a card once production started.

In June of 1993 Roßmüller threw in the towel and declared bankruptcy. The editors of *64'er* showed no mercy on the company, and in their July issue called FLASH 8 "a junk pile" and questioned the ethics of the company's owner. FLASH 8 was written off as a failure, and the project was dead. RIP. Yeah, right.

Like an old Christopher Lee vampire movie, Roßmüller received new blood ($) and new life. A new company was formed, and FLASH 8 was resurrected and presented as a nearly completed product at the Hobbytronic show in Dortmund, Germany in February.

That's the background. Let's get down to the specs. Just what can FLASH 8 do and not do? First the bad news. C-128 owners can forget FLASH 8; it just won't work with your computer—not even in C-64 mode. The card itself is currently being sold, but the software and firmware is still a bit "buggy". Each card must be adjusted to the C-64 it's attached to. This is a trial and error process which can take a bit of time. FLASH 8 is not yet fully compatible with CMD devices, and cannot be used with Commodore REUs. GEOS users will have to install patches that change the GEOS Kernal, CONFIGURE file, and even the 1351 mouse driver files permanently. Disk access is not accelerated and from ten tested games, only one worked with the FLASH 8. This is due to the fast loaders built in to most of the modern games.

Not all the news is bad, though. FLASH 8 is a computer in itself. The heart of the unit is a 16-bit 65C816 processor which can emulate a 6502. The card is sold in two versions: one with 256 KB of RAM, the other with a full Megabyte. Both have a 27C512 EPROM which contains the operating system. Programs which *do* run with the card, run *fast!* Working and scrolling in a geoPaint document is really impressive. Vizawrite, Printfox, StarPainter, StarTexter and HiEddi are some of the programs that have been tested over here and work extremely well with the FLASH 8. Programmers will have a ball writing games and other applications for the card. Included with the product is a CP/M emulator, a macro library of the new processor instructions, and a patch for GEOS. There are also instructions for using a parallel hookup to a 1541 drive with the card.

My opinion of FLASH 8 can be summed up in the following sentences: It has great potential and expectations are running very high. If Roßmüller can deliver complete compatibility with proven devices and software, FLASH 8 will sell and sell big. *Commodore World* will present test reports in an upcoming issues, so stay tuned. *Foreign Exchange* will keep you posted on this and other C-64/128 developments overseas.

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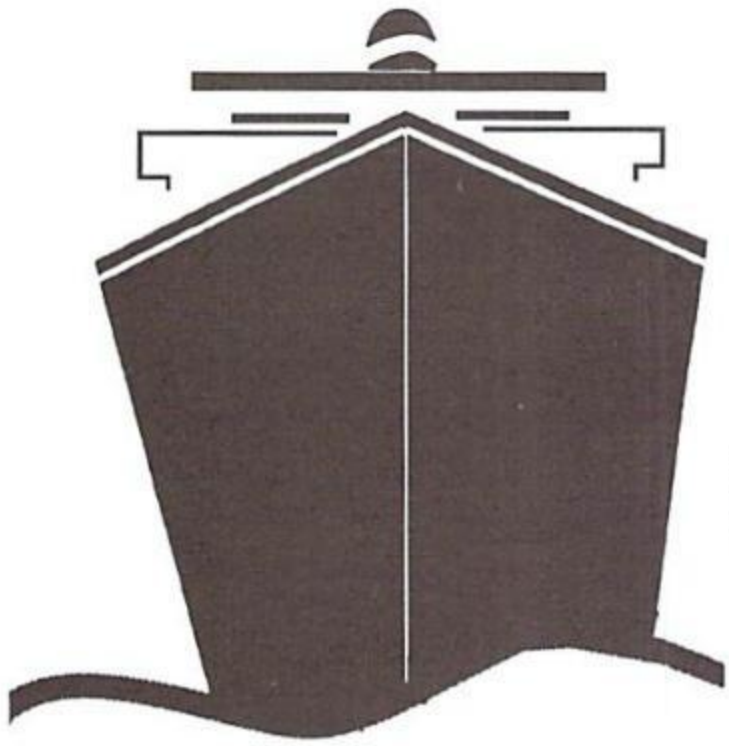

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TELECOMM

MODEMS, INTERFACES, & ONLINE NETWORKS

by Gaelyne R. Moranec

Some of my dearest friends are those I've never met, but have shared conversations with via my Commodore and modem. It's always interesting to load up my term program and find out what others have had to say, read about new happenings in the Commodore world, and in the remainder of the world at large. If I've been away from it for awhile, I tend to find myself humming the Cheers theme song as I prepare to call a favorite bulletin board to pick up my mail; it's nice to be able to "go" someplace where everyone there knows me and we each share common interests. That I can do this without leaving the comfort of my computer room is nicer still.

So how does one go about getting started with telecommunicating? Entire books have been written on the subject; but within the confines of this article, I'll do my best to help you get started. I'll discuss some of the things you can enjoy via your modem, and then I'll talk about the basics of setting up a modem and term program.

What is Telecommunications?

It's a long word, but essentially it means using your phone lines to communicate, usually via modem and computer. I personally prefer the term "BBS'ing", not only because it's shorter and closer to what I actually do when I use my modem, but it also seems more personal. The term BBS'ing fits, as I call Bulletin Board Systems (BBS for short), and on-line services to read messages, catch up on the national news, and keep in touch with others who enjoy the same interests I do. Telecommunications is too long and technical of a word for an activity that has far more "people" interaction involved in it than the computer equipment interaction used to accomplish it.

Staying in touch...

I have a sister who lives in another state whom I rarely talk to these days; yet, we're probably more aware of what each has going on now than we ever have been in the past. We communicate very often with each other by sending short messages via modem. We each call the same on-line service, and by sending each other messages we stay in touch with each other; we've also reduced our previous phone bills by more than half. I also stay in touch with friends and relatives in other countries using a variety of different mail services.

On-line services and Bulletin Boards have message systems that allow users to leave private messages or post public messages in a variety of different ways. There are many different names for doing these same things, depending on the system you happen to call. Some Bulletin Boards are "networked", so that when you leave a message in a specific area, your message will appear on all the other bulletin boards which are connected to the same network. This allows people from all over the country, and indeed the world, to share ideas and enjoy a common bond. BBS's that are networked carry individual areas, also called conferences or echoes, covering various topics. This helps to avoid clutter, and allows you to participate in only those message conversations that interest you. For instance, if you enjoy gardening, you can find a conference (or two or three) devoted to just this topic.

Using on-line services and bulletin boards, you can find support for nearly any hobby (such as gardening, car racing, music, art, computers, astronomy, needle point, etc.), for most professions (medical, computer, technical, restaurants, etc.), and for just about any kind of

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selfhelp group (alcoholism, diabetes, alzheimers, carpal tunnel syndrome, to name just a few). There's even support for those addicted to their computers. [*Perhaps we need this? -Ed*]

Access to Software

There's more to the world of telecommunication than messages. There's also a wealth of public domain and shareware programs to be had. If you've ever wanted a program to do something specific for you, but didn't know where to find it, chances are you can locate it on-line. And if you still can't find it, you can ask about it in one of the many Commodore support message areas. It's illegal for any BBS or on-line service to carry commercial software; so you won't find, for instance, Superbase... but you will be able to find a variety of public domain databases, one of which just might be exactly what you're looking for. *Shareware* is a try before you buy kind of software, in which if you use the program on a regular basis, you are expected to send the author payment for the program. You name the kind of software you're looking for, and you can likely find it on-line somewhere. Just a small list of the kind of things you can find for your computer on-line include graphic files such as geoPaint files, Doodle! graphics, Print Shop graphics and fonts; text files about just about any topic you can think of, including some very informative Commodore specific files; disk related programs such as copiers, formatters, and directory editors; text and sequential file editors, database programs, business programs, and of course, telecommunications type files such as term programs and off-line mail readers. Oh, and games! There are probably thousands of Commodore games available for the download.

On-Line Games

Did I mention games? Both on-line services and Bulletin Boards offer games for their users that you play on-line, and depending on the game, you either compete with another user who is on-line at that same time you are, or the system saves your score along with the scores of other players and keeps track of your winnings. I know of one BBS that offers a computerized race track derby, gives you "BBS" money to gamble, and then lets you spend your winnings on other things the board offers for auction. I recently "purchased" a box of **real** fudge this way—and it was delivered to me personally by the people who run the bulletin board. Other BBS's and services usually offer free time on-line or other prizes for games. There are numerous solitaire type card games which can be played, dozens of poker style games, and heaps of role-playing games ranging from space adventures to dungeon type adventures. There are both bulletin boards and on-line services which specialize in on-line games.

Research

Getting serious, there's also a great deal of research that can be done via modem with your Commodore. Some of the terms in the telecommunications glossary accompanying this article are from research I did in the process of preparing to write this article. I know, the word, "research" can be a four letter word spelled "work"; but seriously, it's much easier to use the modem to call an on-line service or BBS to find information than it is to get in the car, drive to the library and search for what you're looking for, copy it down, return home, and then punch it into the computer. Generally any kind of information you find via modem has the major advantage of already being a computer file. The last time I went to the library, most of my research was accomplished by using their computer system; I discovered, after the fact, it was connected to the rest of the world's libraries (or so it seemed) through the Internet. I could have accomplished the same thing without ever leaving home. Researching from home with a modem has the advantage of timeliness, too. I've found reference material that was made available just the day before I went looking for the information! Almost all of the major on-line services have encyclopedias on-line, and now many of the larger bulletin boards also have this facility available. The encyclopedias are especially useful if you happen to have a child at home working on school reports. The services also have databases, which usually cost more to use, but also offer "search" abilities so that you can search for whatever topic you're looking for and generally find it.

Classified Ads... Electronic Style

I've found some real bargains in used Commodore equipment and software via modem. Many of the Commodore support areas offer either separate message areas with "For Sale/Wanted" type messages, or allow such messages in with the regular flow of Commodore support conversations. Naturally, once an item has been purchased, it must be paid for and sent usually by postal mail, unless the other person happens to live nearby. Some of us live in places where we'd never be able to find that special computer device we've been looking for, but because the messages in the support areas are either national or international, it can make finding anything quite a bit easier. The same holds true for selling equipment, too. This isn't limited to just Commodore equipment, either. Take a look at the types of things normally sold in your local newspaper's classified ads, and you will have a good idea of the variety of miscellaneous stuff you can either buy or sell via modem.

What You'll Need

Now that you have an idea of the kind of things you can do with a modem, it's time to take a look at what it takes to connect to the rest of the world out there in cyberspace. Although it may seem like a lot, and it may seem a little complicated, it really is just a matter of mind-set. If you can remember when you learned to ride a bike or drive a car, you'll know that you didn't learn everything you needed to know all at once. But after a time, these things became much easier, and now they're probably things you don't even think about at all. Modeming is much the same way. Don't expect to learn everything all it once. It really is a learning process and you can take pride in each step along the way. I remember feeling quite proud of myself when I first downloaded a file without a hitch—after many unsuccessful tries—because I hadn't quite grasped the concept of how to go about it. Now I

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do this on a daily basis, and it really is something like putting the car into gear—I really don't give it much thought any more. In other words, the first thing you need is patience with yourself, your equipment, and your software.

I'll assume you already have a Commodore 64 or 128 and jump to other equipment you'll need. Naturally, you'll need a modem. Physically, there are two different types of modems that we Commodore users can use. The first is one which will connect directly into the user port the C-64 or 128. These are Commodore specific modems, such as Commodore's 1670 modem, or an Aprotek MinimodemC or C-24. The other kind of modem we can use are generally any **external** modems designed and sold for other platform computers. "Internal" modems for other computer platforms will not work for us, but the externals work just fine, and offer the convenience of being able to use it with any other computers we happen to own.

If you're going to hook up an external modem designed for other computer platforms to your Commodore, you'll need something to go between the modem and the computer to translate the signals for you. This is called an "RS-232 interface". There are two different types of interfaces; one which plugs into your User port, and another which plugs into the cartridge port. Which kind you need really depends on what kind of external modem you are going to use. If you have a 1200 or 2400 baud modem (9600 for C-128 owners), you can get away with the User port style. Some of these are still commercially available, but are becoming more rare with time. Some of the names you can look for on the used market and in catalogs for companies which carry Commodore equipment include Aprotek, Omnitronix and Peak Peripherals. The names will usually be followed by "RS-232 Interface". Faster modems, such as 9600 baud (C-64 owners) and beyond require the use of a Cartridge port interface. These can handle the faster speeds because they contain a hardware UART chip. There are three of these available, two of which are available in the commercial market: CMD's SwiftLink, and the HART Cart; the third interface is one you can make yourself or have someone make for you, called Data Pump. For just about any of the Interfaces mentioned, you will also need a cable, generally called a DB-25 cable (although the SwiftLink requires a DB-25 to DB-9 cable). These, luckily, are very easy to find—just about any store which carries computer equipment has them available.

I know that I just tossed a lot of unfamiliar terms at you, but you can look most of these up in the glossary provided in this issue to find out their meanings and uses.

Slowing the pace a bit, now that I've described the equipment, lets cover some other information regarding the modems and interfaces that you will need to know before deciding which will work best for you.

Some term programs (which I will discuss shortly) work better with some modems and/or interfaces than others. Most of the Commodore 1200 baud and Aprotek Commodore-ready modems will work with just about any term program available, but have the disadvantage of being slow. The modems which require an interface will also generally work with almost any term program currently available, but not with some of the older programs such as CCGMS or Q-Link's terminal software. SwiftLink has the advantage of being readily available commercially, and both SwiftLink and the Hart Cart offer vast improvements in speed over other interfaces. But because these are relatively newer devices, there are fewer term programs which support them. On the flip side, the software that supports the SwiftLink and Hart Cart are also fairly current. The final choice in which modem and interface (if required) to purchase depends on what your own needs are, and what you want to spend on equipment.

As I've mentioned, you'll also need software called a term program, terminal program, or

Telecommunication Speeds

A COMPARISON OF TRANSFER SPEEDS OF POPULAR TERMINAL PROGRAMS

I've often been asked, "What's the best terminal program?" This isn't an easy question to answer, since many terminal programs contain similar in features. And while the communication speed of one program may be better than another, it may not offer you a feature that the other one does, or may have a more awkward user interface. It's important to note that the speed comparisons presented here do not tell the whole story, but they at least give you an indication of what to expect when communicating at various rates. All test results were achieved via direct null-modem connection, using text-based test files the size of which was calculated using connection speed x 12. Each program was tested for the best possible speed by using RAM devices for transfers. Transfers using mechanical (disk) devices will be slower, especially at higher connection rates.

Recieve Speed (download)

Program	Storage Dev.	Int.	Handshake	2400	4800	9600	19200	38400
Novaterm	REU (RAMDOS)	UP	XON/XOFF	192	---	---	---	---
Novaterm	REU (RAMDOS)	SL	RTS/CTS	192	339	526	720	857
Novaterm	RAMLink	UP	XON/XOFF	200	---	---	---	---
Novaterm	RAMLink	SL	RTS/CTS	200	359	593	820	985
Dialogue 128	REU (RAMDOS)	UP	XON/XOFF	200	366	---	---	---
Dialogue 128	REU (RAMDOS)	SL	RTS/CTS	200	376	608	846	915
Dialogue 128	RAMLink	UP	XON/XOFF	205	371	---	---	---
Dialogue 128	RAMLink	SL	RTS/CTS	216	391	638	1056	1120
Fritzterm	RAMLink	SL	XON/XOFF	217	413	734	1155	1625
Fritzterm	REU (direct)	UP	XON/XOFF	218	---	---	----	----
Fritzterm	REU (direct)	SL	XON/XOFF	218	434	803	1431	2067
Fritzterm	RAMLink	UP	XON/XOFF	220	---	---	----	----
Desterm	REU (direct)	UP	XON/XOFF	230	427	827	----	----
Desterm	REU (direct)	SL	None	230	433	847	1488	2712

Transmit Speed (upload)

Program	Storage Dev.	Int.	Handshk.	2400	4800	9600	19200
Novaterm	REU (RAMDOS)	UP	XON/XOFF	189	---	---	---
Novaterm	RAMLink	UP	XON/XOFF	191	---	---	---
Novaterm	REU (RAMDOS)	SL	RTS/CTS	203	357	566	803
Novaterm	RAMLink	SL	RTS/CTS	202	366	603	893
Dialogue 128	REU (RAMDOS)	UP	XON/XOFF	212	382	---	---
Dialogue 128	REU (RAMDOS)	SL	RTS/CTS	212	382	646	900
Fritzterm	RAMLink	UP	XON/XOFF	217	---	---	---
Dialogue 128	RAMLink	UP	XON/XOFF	220	409	---	---
Dialogue 128	RAMLink	SL	RTS/CTS	220	409	711	1112
Fritzterm	REU (direct)	UP	XON/XOFF	220	---	---	----
Fritzterm	RAMLink	SL	XON/XOFF	226	424	764	1287
Fritzterm	REU (direct)	SL	XON/XOFF	230	439	803	1488
Desterm	REU (direct)	UP	XON/XOFF	235	431	801	----
Desterm	REU (direct)	SL	None	235	450	872	1529

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sometimes called communications program. I'll stick with term or term program to make it easier. This is a program which "talks" to your modem, and allows you to do many different things once you are on-line. It tells your modem how to send information, and it interprets how the information received through the modem looks on your screen. Because many of the best term programs offer a variety of choices on many different things, they can be very confusing at first. This is another area where patience really comes into play, and reading (rereading if necessary) the documentation that comes with it is very important. Some of the term programs which are readily available commercially, through user groups, or via BBS's and other on-line services include Novaterm and Fritzterm for the 64, and Desterm and Dialogue 128 for the 128.

Terminal emulation is something that the term program handles for you, and it's well worth mentioning, as many Bulletin Board systems which are run using MS-DOS style computers use what is called ANSI graphics. In fact, several Commodore BBS's also offer ANSI graphics now, too. My very first modem call was to one of these boards, and my screen looked very odd indeed, as I didn't know anything about ANSI at the time. If you call a bulletin board, and see number codes inside brackets alongside the words, you can be fairly sure that you need to set your term program for ANSI emulation. Once you've done this, things should look far more "normal". When calling an on-line service, however, you should probably set the emulation for "ASCII", "Standard" or VT-100. If you know that you're calling a BBS run on a Commodore 64 or 128, you can try C/G or Color Graphics emulation. At this point I wouldn't worry much about what each of these mean, but by experimentation, you'll find which terminal emulation works for each system you call. Luckily, you can save your configurations within the term program, so these are not things you have to remember each time you use your modem. Usually this information is saved along with the (electronic) phone book the term program stores for you.

Places to Go!

I've mentioned the words Bulletin Board, BBS and on-line service several times, and now it's time to talk about exactly what these are, their similarities and differences, and what each has to offer. The terms Bulletin Board and BBS are interchangeable and mean the same thing. Bulletin Boards are generally smaller systems which are run on home computers and have a little less to offer than the major on-line services which cater to a larger "audience". I say generally,

Signing Up with On-line Service Providers

CompuServe

Voice Assistance 1-800-848-8990

Terminal Program Configuration:
- 300/1200/2400 Baud
- Terminal Emulation: ASCII
- Full Duplex.
- Local Echo OFF.
- 71E (7 data bits, 1 stop bit, EVEN parity)

Dial (voice) 1-800-848-8199 to receive INFO such as temporary User ID numbers, temporary password, and your local access phone number for CompuServe.

Dial CompuServes local access number.

Prompt	Expected Response
CONNECT	<RETURN>
HOST NAME:	CIS <RETURN>
User ID:	[per supplied INFO]
Password:	[per supplied INFO]
Agreement Number:	[per supplied INFO]
Serial Number:	[per supplied INFO]

Answer questions and follow the on-line instructions to complete initial sign-on.

The Phoenix Network

Voice Assistance 1-800-869-1155

Terminal Program Configuration:
- 300/1200/2400 or 9600 baud
- Terminal Emulation: ANSI or ASCII
- Local Echo OFF
- 8N1 (8 data bits, no parity, 1 stop bit)

Call the voice support line to obtain a SprintNet access phone number for your area. To sign on, call the SprintNet number provided.

If calling at 300-1200 baud:

Prompt	Expected Response
CONNECT	<RETURN> D <RETURN>
TERMINAL=	D1 <RETURN>
@	61260433 <RETURN>

If calling at 2400 or 9600 baud:

Prompt	Expected Response
CONNECT	@D <RETURN>
TERMINAL=	D1 <RETURN>
@	61260433 <RETURN>

Answer questions and follow the on-line instructions to complete initial sign-on.

CRS Online

Terminal Program Configuration:
- 1200/2400/9600 baud or 14.4K bps
- Terminal Emulation: ANSI or ASCII
- Local Echo OFF
- 8N1 (8 data bits, no parity, 1 stop bit)

Phone (416) 213-6002 or (416) 213-6003

Answer questions and follow the on-line instructions to complete initial sign-on.

New Users have 1 hour to check out the system. No downloads are allowed until membership is paid, execept for utility files, bulletins about the system, user guides and conference lists.

Delphi

Voice Assistance 1-800-695-4005

Terminal Program Configuration:
- 300/1200/2400/9600 baud or 14.4K BPS
- Terminal Emulation: ASCII
- Full Duplex
- Local Echo OFF
- 8N1 (8 data bits, no parity, 1 stop bit)

Dial: 1-800-695-4002

Prompt	Expected Response
CONNECT	<RETURN> - several times
Password:	FREE

Answer questions and follow the on-line instructions to complete initial sign-on.

GEnie

Voice Assistance 1-800-638-9636

Terminal Program Configuration:
- 300/1200/2400 baud
- Terminal Emulation: ASCII or VT100
- Half Duplex
- Local Echo ON
- 8N1 (8 data bits, 1 stop bit, NO Parity)

Dial 1-800-638-8369

Prompt	Expected Response
CONNECT	HHHHH
U#=	SIGNUP <RETURN>

Answer questions and follow the on-line instructions to complete initial sign-on.

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On-line Shortcuts to Commodore Support

GEnie
M625
CompuServe
GO CBMSERVICE
To find other CBM areas
FIND COMMODORE
Delphi
GO COM COM
The Phoenix Network
/GO COMFORUM
CRS Online
J 13

because there are some very major BBS's that carry almost as much or more in the way of services than the on-line services do. Most BBS's are free, in the sense that if you dial a local phone number to reach it, there are no charges to use it. The exception of course, are the larger ones which offer more services. These BBS's usually are "subscription" boards, which give users who subscribe for a period of time (usually six months to a year) extra services or time on-line. The costs can range from as little as $10 to $100 or more. It depends entirely on what the SysOp (the person who runs the BBS) decides to charge.

On-line services the larger services which offer everything from Internet services to Databases and encyclopedias. GEnie, Delphi, CompuServe, and even the soon-to-be shut down Q-Link are examples of on-line services. Usually the services charge a monthly fee which is charged to your credit card account whether or not you use the service for that month, and allow a specific amount of time on-line before adding more charges to your credit card. Some of the features of an on-line service may cost extra regardless of when you use the feature. Most of the services also charge a lot extra when you call during the daytime rather than during the hours between 6 PM and 6 AM.

Sometimes the distinction between BBS's and on-line services get blurred. For example, services that run using BBS software, but which use extra equipment to allow access to a larger number of users than a standard BBS could normally allow, and/or offer far more in the way of features than a standard Bulletin Board. CRS and Phoenix are two such services which fall into this category.

There ARE on-line services which are not accessible to Commodore 64 and 128 users because they require the use of specially designed MS-DOS or Macintosh software which functions only for their services; these include Prodigy, AOL (America On-Line), and Imagine!

The Big "I"

The Internet is neither here nor there. It belongs, seemingly, to no-one, and is run, seemingly, by no-one and everyone at the same time. It is the largest "network" of computer systems in the world, and is becoming larger every minute (literally). It's available in one form or another to almost any on-line service member, and increasingly to those who subscribe to BBS's which offer some of the Internet's features as part of their services. Not all on-line services provide full access to the Internet, although most offer at the very least "E-Mail" service. Internet E-Mail allows you to send messages anywhere in the world, and have it usually arrive at it's intended location within just a couple of minutes, or at most a few hours. Entire "conversations" of several messages can be had with people in distant countries in less than 24 hours. It really is quite amazing. There are also many services which can be received through just Internet E-Mail alone, but most of these services are also available in other formats too. Newsgroups are the Internet equivalent to topic specific message bases such as I've mentioned above. One such group is the COMP.SYS.CBM Usenet newsgroup which carries international conversations about Commodore computers.

Wrap Up

A modem and term program allow you to reach out and be a part of global community, whether you're communicating with a friend down the street, or with friends halfway around the world. Hopefully this article has helped you to learn what telecommunicating has to offer you, what you need in the way of both hardware and software, and about some of the places you can "visit" while in the comfort of your home with your Commodore. I hope to see you "on-line" soon!

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On-line Service Fees

Service	Fees	Fee Coverage	Internet Services & Fees
GEnie	$8.95/month	Includes 4 hrs/month (non-prime)	E-mail; Sysops will locate and upload files from FTP sites. Full access planned for '95.
	$3.00/hr addt'l.	Additional hours (Evenings & Weekends)	
	$12.50/hr addt'l.	Daytime access surcharge	
CompuServe	$8.95/month	Unlimited Basic Services	E-mail ($.15/message) Telnet (Extended Service)
	$4.80/hr addt'l.	Extended Services 1200-2400 baud	
	$9.60/hr addt'l.	Extended Services 9600-14,400 baud	
Delphi	$10.00/month	Includes 4 hrs/month (10/4 Plan)	E-mail, Usenet Newsgroups (no charge). FTP, Gopher, Telnet ($3.00/month addt'l.).
	$4.00/hr addt'l.	Additional hours (10/4 Plan)	
	$20.00/month	Includes 20 hrs/month (20/20 Plan)	
	$1.80/hr addt'l.	Additional hours (20/20 Plan)	
	$9.00/hr addt'l.	Daytime Sprintnet access surcharge	
Phoenix Network	No Monthly Fee	N/A	None
	$4.50/hr	300-2400 baud, M-F 6PM-7AM, Sat & Sun	
	$6.50/hr	9600 baud, M-F 6PM-7AM, Sat & Sun	
	$8.00/hr	300-2400 baud, Weekdays 7AM-6PM	
	$10.00/hr	9600 baud, Weekdays 7AM-6PM	
CRS Online	CDN$125.00/yr.	2 hrs/day online, 2 MB/day download limit	None

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A Glossary of Telecommunications Terms

compiled by Gaelyne Moranec

103 - Officially, 'Bell 103' which is the standard controlling transmission at 300 bps in the United States.

212A - Officially, 'Bell 212A' which is the standard controlling transmission at 1200 bps in the United States.

alias - A name that users can use on a bulletin board that is not their own. [Also called handle].

ANSI emulation - The ability to send, receive, and display ANSI graphics.

ANSI graphics - A set of cursor control codes which originated on the VT100 smart terminal.

answer mode - When a modem is ready to pick up the phone when it rings. After picking up the phone, the modem will attempt to make a connection with another modem. All BBS's are in answer mode.

ASCII - An acronym for American Standard Code of Information Interchange. MS-DOS style computers use this, while Commodore computers use PETASCII. Most CBM terminal programs can translate text files between the two formats.

auto-answer - When a modem has the ability to automatically pick up the phone when the phone rings and then attempt to connect with another computer.

auto-baud detect - The ability of a modem to change to a lower bps rate if the computer it is calling is unable to communicate at the requested speed.

auto-download - The feature of some protocols where the BBS can automatically make your communications program start a download or upload. Novaterm's Z-Modem download has this ability.

auto-reliable - The ability of a modem to be able to communicate both with modems that do have error-control and/or data compression, and those that do not.

batch file transfer - This is when more than one file is sent at a time by a file transfer protocol.

baud - A term referring to the speed at which modems communicate. Technically, it is the number of changes in an electronic signal per second. Since the number of changes used to be the same as the number of bits sent or received per second, bps and baud are often used interchangeably.

BBS - An acronym for Bulletin Board System. Usually it is a home computer that has a modem attached and is waiting for calls from other computers. BBS can also be expanded more simply to 'bulletin board' or 'board'.

block - A group of data bytes. For example, when downloading a program, block sizes of 128 or 1024 characters are common.

block size - This term, when used with either error control or data compression protocols, refers to the number of characters to be sent at one time. If error control is used, the codes are sent immediately following this block.

bps - Bits Per Second. The transmission speed of most modems is measured in baud or bps. Bps is literally the number of bits sent by the modem every second.

buffer - To save all incoming data in memory. Most term programs have buffers. Usually what is saved to buffer is then manually saved to disk by the user.

bulletin - A special message posted on a BBS, usually written by the SysOp.

capture - To 'catch' text that is being sent to your computer from a BBS and put it in a buffer or a file.

capture buffer - The area in a computer's memory where a communications program stores incoming data that is to be saved.

carrier - The tone that the modem sends over the phone lines. Data is modulated onto this tone, so it is referred to as the carrier tone.

carrier detect - when the modem senses a carrier, you are connected to a BBS or online service. [Abbreviated as CD].

characters per second - The number of bytes or characters sent over the phone lines in 1 second. [Abbreviated as CPS].

chat mode - A terminal program mode used to "chat" with someone on the other end of the line. Only after the return key is hit will the line of text be sent to the modem.

checksum - Commonly used when downloading a program, and in error control protocols. The checksum is the result of a mathematical equation.

Co-SysOp - Person who assists the Sysop of a BBS and has a little more access than regular users.

conference - A group of related messages on a BBS. Often, many BBS's are linked together for a conference so that users on all the BBS's can see and reply to the messages.

connect speed - The speed, generally stated in bits per second, which your modem uses when it connects with another.

connection - The actual contact with another computer.

control character - Any of the 32 ASCII characters that do not print on your screen or printer. These characters are usually used to control your computer.

CRC - Stands for Cyclic Redundancy Check. CRC is a system to make sure that a block of data is as free from error as possible.

CTS - Clear To Send. This is when the modem lets the other computer know that it can send information to the other computer.

CTS/RTS - The method of flow control that uses the CTS and RTS signals on an RS-232 connection. This is a form of hardware handshaking, enabling connected systems to determine when data can be transferred.

data bits - [1] The number of bits that the modem uses to represent one byte. This is usually 8, though it can be 7, since ASCII text characters need only 7 of the 8 bits. [2] The actual data bits within a byte being sent through the phone lines.

data compression - Using data compression, a modem can send information faster. Both sending and receiving modems must have this ability to use it. It does not compress files which are already compressed, however.

data modem - A modem that does not have the ability to send or receive fax transmissions.

DB-25 - The 25 pin plug that connects an RS-232C cable to the RS-232 port. Modems generally use this connector.

DB-9 - The 9 pin plug that connects an RS-232C cable to the RS-232 port.

DCD - Data Carrier Detect. This tells the computer whether or not the modem is connected to another modem.

DCE - Data Communications Equipment. These are computer peripherals that communicate. A modem is a DCE.

dialout facility - A service which you dial a local number which connects you to other computer systems. Telenet is an example.

disconnect - To hang up the phone and cause the connection between your modem and another computer to be stopped.

door - An external program of the BBS. Usually either games or offline mail facilities are doors.

download - To receive a computer file from a bulletin board.

DSR - Data Set Ready. This indicates that the modem is on, and ready to accept input from the computer.

DTE - Data Terminal Equipment. This is computer equipment which is not directly responsible for communicating, for example, the computer itself and printers.

DTR - Data Terminal Ready. The DTR signal is sent from the computer to the modem, to let the modem know that the computer is ready to communicate.

E-mail - Electronic mail. Messages that are sent to individual people. Through networks, it is possible to send mail to anyone on any BBS in the network.

E-mail address - Similar to a postal mailing address, an address lets people know how you can be reached on a network. It may consist of numbers and/or words.

echo - A reference to an echomail conference. For example, "This echo has too many messages." Also used to decribe when a bulletin board or your terminal program sends back the characters that you type.

echomail - Many BBS's have message bases that are shared with other BBS's. Sometimes echomail can extend across the world.

effective transfer rate - This is the rate at which data can be sent after data compression has been accounted for.

error control - The ability of a modem to notice errors in trans-mission, and have any incorrect data re-sent.

escape sequence - A sequence of characters (usually +++) that tell the modem to change from data mode to command mode.

factory configuration - The way that your modem was set up when it left the factory. Typing AT&F normally returns your modem to this setting.

fall-back - The ability of a modem to change to a lower speed when there is a problem communicating at the higher speed.

fall-forward - This is when a modem will change to a faster speed if line conditions improve after a fall-back occurs.

faxmodem - A modem that can send and receive faxes.

feature negotiation - Part of hand-shaking, where a modem determines the best speed, error control, and data compression protocols for connecting to another modem.

feed - Connection between a BBS and a message network.

feedback - A message that is sent by a user to the SysOp of a bulletin board.

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FidoNet - A public network connecting thousands of BBS's around the world.

flow control - A method of controlling when information is or is not sent.

freq - Short for "File REQuest." It is used to get program(s) from a BBS, without logging on. Only Sysops can FREQ files from other Sysops. Users generally ask the Sysop to FREQ file(s) for them.

FTP - File Transfer Protocol. This is the method of transfering files on internet.

full duplex - The ability to simultaneously transmit and receive data.

half duplex - Mode which allows only one modem at a time to transmit information.

hand-shaking - General term for the methods two communications devices use to synchronize with each other.

Hayes AT command set - This is the set of commands used to operate Hayes and Hayes-compatible modems.

Hayes-compatible - Modem which supports the Hayes AT command set.

initialization string - A series of commands sent by your terminal program to configure your modem, usually when the program is started or when auto-dialing pre-defined communications service telephone numbers.

internet - This is the largest network of linked computers. Originally started by the U.S. Government.

internet address - This is an address used to reach someone on the internet.

internet relay chat - On the internet, 2 or more users to talk (type) to each other in "semi-real time". Messages may take a while to reach each other, but quick enough that they can wait for replys and "chat." [Same as IRC].

Kermit protocol - An almost error-free file transfer protocol usually used for text transfers.

LAPM - Link Access Procedure for Modems. A type of error control used by some modems. It is NOT a compression method, though some modem manufacturers have incorrectly advertised it as such.

line noise - This is interference on the telephone lines. It causes garbage to appear on your screen.

local echo - This is when a communications program will send information (either that you type or from a file) to your screen, as well as to the other modem.

logoff - To leave a BBS, and disconnect the phone line. [Same as exit, quit, goodbye].

logon - The process of connecting to a BBS. "Logon" can include the process of entering your name and password.

mailer - A program used by BBS's that allows other BBS's to call, so that mail and/or files can be transfered automatically between the two.

message base - A group of messages on a BBS pertaining to a certain topic..

MNP - Microcom Networking Protocol. A type of error control and data compression, created by Microcom, that many newer modems use. It is built into the modem, unlike software error correction in file transfer protocols. There are different MNP levels. Levels 1-4 are error control protocols, and level 5 is a data compression protocol that can compress data to about 50% of its original size. A modem with MNP-5 also has MNP-4. MNP 1-4 is also included in the CCITT V.42 error correction system.

modem - MODulator/DEModulator. The device used for computers to communicate over telephone lines.

moderator - The person who is in charge of a conference. This person usually has the task of making sure that users of the conference follow the conference rules.

netmail - Messages that are sent over networks of BBS's to specific people. Similar to Internet E-mail.

network - A group of BBS's that are "linked" together. This means that the BBS's share messages and sometimes files.

non-volatile memory - This is memory that many modems have which is not destroyed when the power is turned off.

null modem - A connection between two computers locally, causing the computers to act as if connected via a modem. Generally used to transfer data from one machine to another.

off-line - When your computer is not connected to another BBS.

off-line mail reader - A program that allows you to read messages and reply to them after you call a BBS.

on-line - When your computer is connected to a BBS.

on-line conference - This is when a group of people "get together" and have a conference using their computers. Major on-line services have this feature. [also called "real-time conference"].

on-line games - Any game that is played on a BBS.

on-line service - usually means a pay service such as Compuserve or GEnie.

packer - A BBS program which packs new messages together to be sent out by a mailer or download by a user for offline mail reading.

padding - This happens when a file that is being transferred ends in the middle of a block of data. The communications program must add blank data to fill up the block. Some term programs will "strip" this before saving the file to disk.

password - A special code that only you know which the BBS asks for each time you logon. Passwords should be changed frequently and should be something you can remember but that others won't guess.

post - To save a message that you have written on a BBS so that other people can see it.

protocol - A method of sending and receiving a program. There are many methods available, each with different advantages and disadvantages. Also used to describe the way that hardware error control is managed.

QWK - A type of mail packet.

RD - Receive Data. This is the wire in an RS-232C cable that receives data.

RJ-11 - This is a normal phone jack. Modems usually have 2 jacks like this, one to connect to the phone line, and the other to connect to a telephone to use when the modem isn't in use.

RS-232 Interface - device which allows Commodore 64 and 128 computers to use common external modems designed for other platforms.

RS-232C - The name of a standard (created by the Electronics Industry Association) for communication between a computer and a serial device.

RTS - Request To Send. The computer tells the modem it wants to send information to the other computer. Only used in half duplex mode.

script language - Many term programs allow the user to write a program, or script, which allows them to use the program without actually typing anything.

SIG - Special Interest Group. This is similar to a message base, but it may also contain files.

Sysop - Short for SYStems OPerator. Person who is in charge of a BBS. Usually the person who paid for the BBS equipment and pays for the phone line.

tagline - Offline mail readers allow you to havea "tagline" at the end of your messages. This is often a funny saying or a quote.

terminal emulation - When a term program imitates a certain brand of terminal, such as ANSI, VT100, etc.

terminal program - A program that controls a modem, and has features that allow the user to do such things as upload, down-load, etc. Also called communications program or term program.

thread - A group of related messages on a BBS, within the same message base.

transfer - To send a computer program from one computer to anoth-er. "xfer" is an abbreviated way to say the same thing.

upload - To send a program from your computer to a BBS.

V.17 - The CCITT standard for fax transmission at 14,400bps.

V.21 - The international standard, controls transmission at 300bps.

V.22 - The international standard for transmission at 1200bps.

V.22bis - The international standard, controls data transmission at 2400bps.

V.23 - The CCITT protocol for transmission of 1200bps one way, 75bps the other way.

V.24 - This, combined with V.28 is the CCITT standard equivalent to EIA's RS-232C standard.

V.28 - Part of V.24.

V.29 - The CCITT standard for 9600bps half-duplex communications.

V.32 - The international standard controlling transmission at 9600bps.

V.32bis - The international standard for 14,400 bps modems.

V.42 - A standard error control system that includes LAPM, as well as MNP 2-4.

V.42 compatible - Modem that follows all the V.42 specifications, except for LAPM error control (uses MNP instead).

V.42 compliant - Modem which follows all the V.42 specifications, and uses LAPM error control or MNP error control.

V.42bis - A CCITT standard for data compression. It can compress data with about a 3:1 compression ratio, 4:1 under the right conditions. Any modem with V.42bis also has V.42 error control.

V.Fast - The proposed CCITT standard for communications at up to 28,800bps.

Xmodem - A file transfer protocol developed by Ward Christensen. Slow by today's standards, but almost every communications program offers this protocol. [Same as Christensen protocol].

Xmodem-1K - Similar to Xmodem/CRC, but uses blocks of 1024 bytes, rather than 128. Faster than Xmodem, since it makes fewer error checks.

Xmodem/CRC - The same as Xmodem, but more reliable as it catches more errors.

Xoff - The CTRL-S character. This is often used to pause information that is being sent. The information will be continued when an CTRL-Q is received.

Xon - The CTRL-Q character. Continues paused information.

Xon/Xoff - The flow control method using the Xon and Xoff characters. This is a form of software handshaking, used to determine when data can be sent and/or recieved.

Ymodem - Protocol which transfers more than one file at a time. It can use both 1024 byte blocks and 128 byte blocks.

Ymodem-g - Ymodem, but changed to provide best results with error-correcting modems. Not widely available for Commodore terminal programs, although included in at least one CBM 128 BBS package.

Zmodem - Protocol known for its speed, auto-download, and batch download features.

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Bad File Names

by Jim Butterfield

Caution: the following discussion of file names and how to fix them is meant for non-Geos disks. Disks containing Geos files are complex, and you should never use the Validate/Collect disk command with such disks.

Two annoying problems can crop up on Commodore disk files that are easy to fix if you know how: "splat" files, and "comma" files.

Splat files have an asterisk (that's the "splat") next to the file type. That means that the file was never closed properly, so it is probably incomplete. Comma files have a name that is simply "," a single comma. Incidentally, you can have duplicate file names here: many files on a disk can all have the comma name.

The best way to get rid of splat files is not to make them in the first place. Since a splat file is incomplete, that is, the program that wrote it never "closed" the file, you can often catch this problem in the making.

Here's how it can happen. You are running a program, and it stops for some reason. Perhaps it had an error, or perhaps you stopped it with the Run/Stop key. No matter. The program is stopped, and the disk light is still on. If you don't do something, the files that are being written will end up as "splat" files. ACTION: type

```
CLOSE 15: OPEN 15,8,15: CLOSE 15
```

The disk light will go out, and all files are now closed. [The trick: closing the "command channel" automatically closes all active files on the disk].

If you didn't do this during the file-writing cycle, you're stuck with a splat file and you must take special action to remove it. DO NOT SCRATCH A SPLAT FILE; IT'S DANGEROUS. Instead, "Validate" or "Collect" the disk. On a 128 or Plus/4, command COLLECT D0. On earlier machines, use the sequence:

```
OPEN 15,8,15
PRINT#15,"V0"
CLOSE 15
```

[The trick: scratching a file is dangerous, since the file is not closed and the "sector chain" might have a loose end. But the Validate/Collect action dumps the splat files and then does a general disk tidying job].

Desperation measure: If you need to data from a splat file, even though you know it's incomplete, you can try. You'll need some programming skills, and must keep in mind that you likely won't receive a normal end-of-file indication. The trick is to open the file with mode 'M', thus:

```
OPEN 8,8,8,"BADFILE,S,M"
```

About those comma files. Somehow, a program tried to write a file that has no name. Maybe it asked you for a file name and you just pressed RETURN. Maybe the program tried to calculate a name and fouled up. In any case, the program has done something like OPEN 8,8,8,",S,W", and the file with no name turns into a comma file. And now it seems as if you can't scratch it or do anything with it.

Unless you have skills in disk sector editing, you can't do too much with the data on these files. But you can get rid of them. Here's how.

Take a directory of all the files on disk that have a one-character name. To do this command:

```
DIRECTORY "?"                    (128 or Plus/4 style)
LOAD "$0:?",8 then LIST          (other computers)
```

If you get only the comma files, you're ready to scratch all files with one-character names. If you get any other files, rename them and go for the directory again (you can always restore the original names when the operation is complete).

To dump all files whose names are only one character long, command SCRATCH "?" on the 128-style machines, or:

```
OPEN 15,8,15
PRINT#15,"S0:?"
CLOSE 15
```

General note: Any time you have had misbehaving files on a disk, it's a good idea to copy all your good files over to a fresh disk and leave your old troubles behind.

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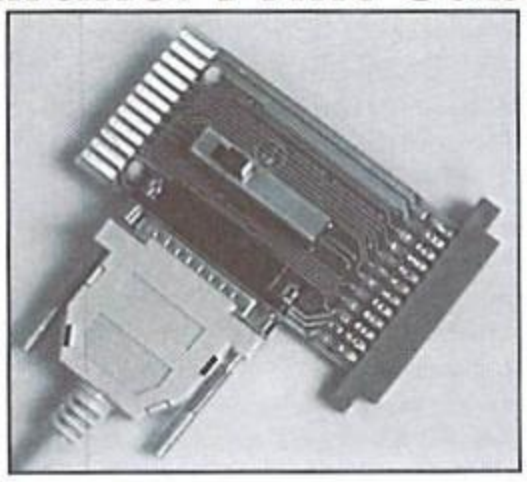

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COMMODORE TRIVIA

by Jim Brain

These trivia questions are my gift to the Commodore Community at large; while other parts of this magazine may not be reproduced without the consent of Creative Micro Designs, Inc., these questions are public domain. I ask only that the article remains intact and unchanged, and that my information appears somewhere so users can contact me. These questions form a contest that I run on the Internet, so you may feel free to contact me for all the relevant information. If you do use them, I always welcome a postcard detailing where they were used. If you have a question, please send it (with answer) as well. Enjoy!

Jim Brain (Internet: brain@mail.msen.com)
Brain Innovations, Inc.
2306B Hartland Road
Hartland, MI 48353

COMMODORE TRIVIA #3 QUESTIONS

$020 What do the letters IEEE in IEEE-488 stand for?

$021 What was the logo of Batteries Included?

$022 The Commodore VIC-20, 64, and 128 computers emulate in software a very important integrated circuit. What is its number, and why is it important?

$023 Commodore watches play a beautiful song for the alarm. What is the song's title?

$024 The C2N style Commodore tape decks are impressive in handling errors. How many times is a single program stored onto tape?

$025 What is a jiffy?

$026 What is the screen resolution of the Commodore VIC-20?

$027 Why is the VIC-20 named the VC-20 in Germany?

$028 Why was early Commodore equipment built into such heavy enclosures?

$029 What two BASIC 2.0 commands might still work if mispelled?

$02A What does CIA stand for? (not the U.S. CIA!)

$02B (hard one) What is the one key VIC capability that makes full-screen hires graphics possible on the _VIC-20_?

$02C How many cassette ports does the CBM 8032 computer have?

$02D What 5 bytes must appear in every Commodore 64 autostart cartrdge and what location in memory must they be placed at?

$02E What is the correct Commodore technical term for "Sprites"?

$02F (Three parter, all parts must be correct) "Push-wrap-crash" is a nickname for a condition that can lock up an old-style C-64. What causes it? How can it be avoided (besides not doing it)? What is the only way out once it has occured (besides rebooting)?

COMMODORE TRIVIA #2 ANSWERS

$00A Lorraine. Amiga was the company name. When Commodore bought the company, they scrapped the model name and used the old company name.

$00B Richard Garriott. Scott Statton has met him and says that he is son of astronaut Owen Garriott.

$00C 59458. It is in the 6522 Versatile Interface Adapter. No, I won't tell you what to poke into it, but I will tell you that it is not the only way to fry a PET. Here's a description from none other than Jim Butterfield: "The poke shown above is correct. Its intention was to speed up early model PETs by masking the RETRACE line (by switching it to output)... however, Commodore subsequently REDESIGNED the interface in such a way that making the VIA pin an output caused (now) two outputs to fight each other... result, VIA and/or video circuitry burnt out. LATER (Days of "fat 40" and 80-column PETs), the new CRT controller chip could be fiddled with POKES so that it generated scan rates completely out of the capacity of the CRT deflection circuits. Result: burnt out deflection circuitry... and that was no YOKE!" Richard Bradley says that 59595 is the second poke that Jim is referring to.
I also have it on word from Ethan Dicks that 59409 is another infamous poke, but I wouldn't try any of these!

$00D Text Editing Device. It did not have as many capabilities as the VIC II.

$00E The Commodore DPS 1101. The CBM 6400 was another earlier attempt at a daisy-wheel printer, but it had an IEEE-488 interface.

$00F 2.6

$010 3.5.

$011 Daphne/Denise, Agnes/Agnus, and Paula/Portia, or Huey, Duey, and Louie. Denise, Agnes, and Paula were the American names, but the the others crept in from somwhere. The ducks were always a joke, but caught on as alternate names.

$012 The Educator 64. It was model number CBM 4064, and it was also called the PET64. Note that this version of the 64 was the second attempt. Commodore first tried to sell the "Educator 64" to schools in the regular 64 case, but administrators and teachers disliked the "homey" look. Thus, it was squeezed into a PET case and sold better, although I don't think it was ever a killer seller.

$013 The Commodore SFD 1001. It was actually half of an CBM 8250 LP with a slightly revised ROM.

$014 Group Code Recording.

$015 The CBM 1551 was the new, high-performance drive that was designed specifically for the Commodore Plus/4 and C-16. The 1542 was actually just a repackaged 1541 in a grey case that was made available for people who didn't want to spend the extra money for the 1551. The extra cost resulted from the 1551 sporting a new, parallel transfer method that increased transfer rates 400%.

$016 Sound Interface Device

$017 Keyboard Entry Read, Network, And Link. This is most likely another "words after the letters" acronym, along the lines of the PET acronym.

$018 3.0

$019 I got more than I bargained for on this question, since there are four drives which have the same DOS version that I feel are adequate responses to this question. (1) The CBM D9060 and D9090, although I doubt the code is the same. The D series were hard drives. (2) The 8280 Dual 8" Floppy Drive. (3) The 1570, which was a single sided version of the 1571 in a 1541 case painted to match the 128. The ROM is slightly different, enough to make it unrecognizable as either a 1541 or a 1571 in some cases. (4) The 1571II and the 1571D, which is the drive in the C128D, also have this DOS revision, but that stands to reason, since they are in the 1571 line.

$01A 144 in both modes. I am surprised Commodore didn't add a track or put another directory on the back.

$01B 144.

$01C Calculators. They also made office equipment, watches, adding machines, and thermostats, hence the name "Commodore Business Machines".

$01D The Commodore 1520. It used 4 inch wide paper and could use 4 colors.

$01E Modified Frequency Modulation

$01F RREG reads the internal registers after a SYS command. OFF gives an unimplemented command error. QUIT does too.

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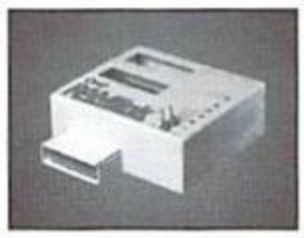

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COPYRIGHTS

WHO OWNS THE RIGHT TO COPY?

By Jeff Jones

As early as 1710 the British recognized the need for authors to be protected from those who would misuse their work. Today the concept of copyright has been expanded, giving any author automatic ownership of anything he creates until well after his death. Anything you create (as long as no one else created an identical work before you) is yours, and only *you* have the right to reproduce it. There are rarely tough luck stories about the author who forgot to register his work. If the author can prove that he created a disputed work, or that the defendant had access to the author's work, they've won the case.

LOADSTAR buys thousands of dollars worth of software every month. This means that we deal with many authors. Occasionally we'll come across an author who so fears that we'll steal his program that he's too much trouble to deal with. It is generally agreed that established reputable companies don't steal work. The reason is most companies would rather pay the author than live forever in fear of a lawsuit. The software company, whether it wins or not, will end up paying more than what the product was worth in the first place—and watch its reputation suffer.

For works created on or after January 1, 1978, the 1976 Copyright Act defines the term of copyright by the life of the author(s) plus 50 years—instead of the previous term of 28 years (renewable for another 28)—measured usually from the date of first publication. A good example of the old copyright is the movie "It's a Wonderful Life" whose owners failed to renew the copyright, leaving the movie to the public domain after a dismal box office showing. Because it's free "PD TV", all a television station has to do is get a good print of it and they can show (upload) the movie forever without having to pay anyone. This couldn't happen today unless the owner willfully released the work into the public domain. Even then the owner has every right to release the title with conditions attached, as is done in shareware.

Since your work is not tangible, and many copies may be made of an original, the copyrighted property of the author is said to be "intellectual property," and the author has the exclusive right to copy and sell his work. Usually the author sells or gives other parties the right to reproduce and sell his work. An author will often forfeit the right to sell the work on his own for an agreed period. In this case an author could be sued for pirating his own work if he were to distribute it to anyone.

Various industries have a history of irrational fear of counterfeiters. When VCRs first appeared, there was industry-wide paranoia of pirates taping The Six Million Dollar Man and somehow finding customers. As a matter of principle, the movie makers felt that no one had the right to record their work and they fought it for years. Now that the networks know that VCRs mean higher ratings (because people can watch two things instead of one), there's no problem. Movie makers can almost guarantee a break-even movie because they eventually make up their box office losses in rental receipts.

Software manufacturers, however, have a *real* reason to be paranoid. People copy programs and share them. I don't know a single person who hasn't had access to at least one pirated work. My first copy of LOADSTAR was a pirated copy. Even people who don't consider themselves pirates probably have at least one illegal program that they found on a disk and failed to destroy.

You can't copy and sell a Stephen King novel without a $500,000 printing press—no one would want your low-quality copy. But with an $80 drive you can make perfect digital copies of programs and sell them.

Because every computer can digitally copy software, computer copyright laws seem more stringent. The law tries to understand that users have a right to back up software, but the letter of the law remains a bit too strict. For instance, "tough" legislation (law 102-561) signed by President Bush in late 1992 says you can be considered a pirate if you have ten copies of one software package in your possession. That's reasonable. But you can also be thought a pirate if you have one copy of ten *different* software packages! If the value of your backed up software adds up to more than $2500, an overzealous or truly computer illiterate prosecutor can run away with it. Couple that with up to 4 years in prison and $250,000 in fines. Unreasonable, particularly when most software packages make the effort to tell users to back up the software to preserve the original. You can only hope that if you're arrested, the policeman is computer literate.

The process of manufacturing and distributing a product without the permission of the owner is called pirating. Some people feel that if they don't make a profit, they are not morally challenged. These people don't realize that when they become so excited about a product that they copy and share it, that they are preventing a sale and damaging the author or publisher.

At 65 percent, the US has highest rate of legal software use, according to the Business Software Alliance (BSA). Because our market is so large, the US is also the leader in losses due to piracy, estimated at $2.3 billion for 1993. Europe has a 61% piracy rate, followed by 11 countries in the Middle East, Africa, India and Pakistan region (85%), Latin America (83%), and Asia (79%).

In everyday situations, copyright cannot be argued. If a someone hands a friend a disk of copyrighted material, and the friend accepts it, they're both committing a crime. It's perfectly legal to sell and trade software—as long as the software is original, and all backups are destroyed.

If the author didn't release the work to the public domain, it is not in the public domain. It doesn't matter how many bulletin boards the program appears on, and it doesn't matter that there's no copyright message. Leaving the message off doesn't prevent the author from suing, although he may not be entitled to court costs because of it. In certain limited cases, use of a copyrighted work is allowed without permission of the copyright owner under the doctrine of "fair use", as well as numerous other exceptions dealing generally with nonprofit, charitable, or educational uses of copyrighted works.

Since the demise of Commodore, rumors have abounded. Voices have declared—in error—that since Commodore is to liquidate, its intellectual property (software and technology) is "up for grabs." I hate to use stock phrases, but nothing could be farther from the truth. It's a common misconception that a defunct company's products are suddenly public domain. This notion is wholly

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wrong, tantamount to saying that the property of an evicted tenant, set out on the street by the landlord, is "free pickings" to any passerby. Sure, people do it, but it's still illegal. I've witnessed people take property this way, but never while the sheriff is on the premises. Orion pictures has closed its doors, but RoboCop is a commodity that's still bought and sold—making money. Someone still owns it.

Beyond the fair use doctrines, many authors and publishers will allow reproductions of portions of their work for news and review. Though the cover of a magazine is copyrighted, the publisher wants all the publicity he can get. If you reproduce that cover in your newsletter, he'll probably appreciate it, fair use or not. What that publisher won't like is for you to reproduce his cover without his logo for your own purposes. More than that, the photographer who owns the picture on the cover might just send you a bill.

Publishers have copyright battles. Apple sued Microsoft for billions over Windows. There are other battles: Lotus/Borland, Apple/Microsoft/Hewlett-Packard, Sega/Accolade. On October 8, 1992, the Supreme Court upheld the decisions of two federal courts, the last being the Ninth Circuit Court of Appeals, that Symantec's Grandview did not violate copyrights on Brown Bag's PC-Outline package. Symantec's Attorney Mitchell Zimmerman said: "The Brown Bag decision is part of an important emerging trend, limiting the scope of copyright protection for computer programs. The decision makes it easier for defendants to dispose of baseless 'look and feel' infringement claims."

In recent years "reverse engineering" has been challenged. Reverse engineering is the act of examining an operating system or a device, and then figuring a way to create original products for it. In August 1992, the Ninth Circuit Court of Appeals dissolved an injunction by the Federal District Court that game producer Accolade could not sell or develop new game titles for the Sega Genesis game system. The extensive paperwork in this landmark decision outlining the reasoning of the court has yet to be released.

Sometimes the owner of a work can overstep the bounds of reason in protecting his product. One thing is very reasonable: if there is a price on a software package, that price should be paid to the owner or an authorized distributor. Furthermore, if a program isn't clearly marked in some way to indicate that it is freely distributable, the only legal way to add it to your collection is to buy it.

HARD TIPS

BUILD A SIMPLE RS-232C INTERFACE

By Doug Cotton

Commodore users today often find themselves trying to adapt our vintage machines to current standards. And while there have been many RS-232 interfaces available in the past, the selection is dwindling quickly. In fact, there are only two choices commercially available these days to fill this void: Aprotek's COM-MODEM Adapter and CMD's SwiftLink. Each of these are quite usable for modem connection, but only the COM-MODEM Adapter will operate with older software written only for the User port (SwiftLink attaches to the Expansion port, and requires compatible software). The problem with the COM-MODEM Adapter is that it won't work for null-modem transfers to other computers because it doesn't use the +/-12 Volt standard. Hardware 'hackers' should appreciate that the circuit in this issue will provide the correct voltages for null-modem connections. While I intended on including a circuit diagram for making a null-modem adapter, it costs less to buy than to build using Radio Shack parts. If you need the adapter, just pick up RS# 26-1496 for $4.99.

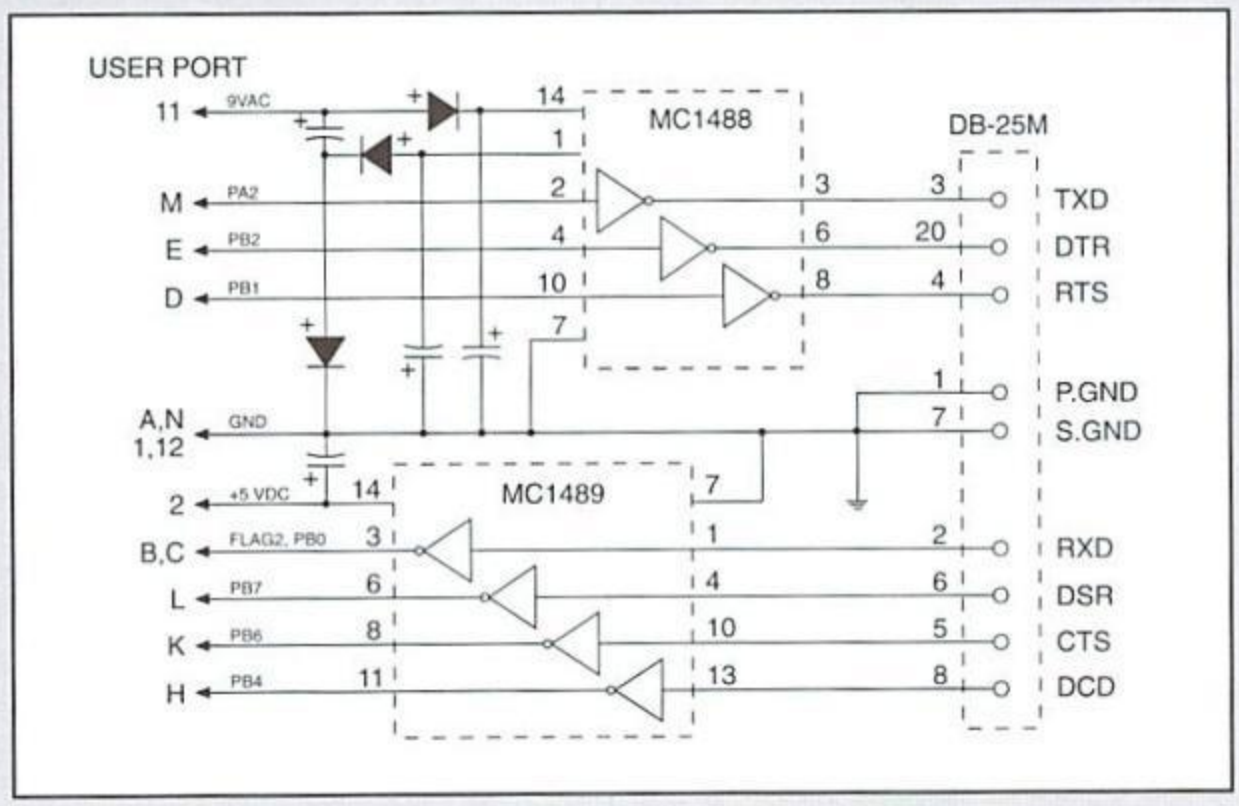
While all the electronics parts shown are easily available from a local Radio Shack, there is one item you'll need that you may have some trouble locating: a 12 position/24 contact card edge connector compatible with the User port. These are available from Digi-Key Corporation in Thief River Falls, Minnesota (1-800-344-4539). Their part number is EDC305240-ND, and the cost is $2.14 in single quantities. This connector can be soldered to the recommended perfboard. If you plan to order from them, they also stock most of the other parts, generally for a much lower cost.

You can also substitute for the connector and wire I chose for this project—I selected ribbon cable and an insulation displacement connector for ease of assembly. You could just as easily use round cable with at least 9 conductors, and a solder-cup DB-25 male connector (RS# 276-1547 @ $1.49). You should naturally purchase a suitable hood for this connector as well (RS# 276-1549 @ $1.19). This will reduce the overall cost of the project as well.

Finally, you'll need all the usual 'hacker' goodies, like hookup wire, soldering iron, solder, wire cutters and wire strippers. And be sure to watch polarity on the capacitors and diodes!

RS-232 Interface Parts List

Qty.	Description	RS Part #	Price	Total
1	DB-25 Male Connector	276-1559	$3.99	$3.99
1	25 Cond. Ribbon Cable	278-772	3.59	3.59
1	MC1488 Line Driver IC	276-2520	1.29	1.29
1	MC1489 Line Rcvr. IC	276-2521	1.29	1.29
3	1N4001 Diode	276-1101	.49	1.47
4	100µF/35V Elect. Cap.	272-1028	.99	3.96
1	Plug-in Perfboard	276-154	3.79	3.79



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SOFTWARE IN REVIEW

Fun Graphics Machine

Fun Graphics Machine, by Ron Hackley; $24.95 plus $3.50 S&H (clip art, font disks and keyboard overlays also available); The FGM Connection, P.O. Box 2206, Roseburg, OR 97470.

It's been a long time since the March/April 1992 issue of *RUN* magazine. In that issue I reviewed Fun Graphics Machine. Since then, I have to admit, I've pretty much left all my graphics and desktop publishing chores to GEOS, since as most of you know by now, I'm a confirmed GEOS-aholic; I stayed with what I knew and was comfortable with.

So when the editor of Commodore World asked me to write a review of FGM, I had to do a little searching. I still had the disks, of course, (and even knew where they were, pretty much), so in that way it was no trouble. I remembered some of what I'd done with the program all those years ago, and even remembered where the box with the keyboard overlays and printouts was. When I found the manual (spiral bound to lay flat, by the way), I wandered through it for an hour or so to remind myself of some of the finer points. Then I booted up the program and started to play around a little, and it didn't take long for things to come back to me. It also didn't take long for me to arrive at some of the same conclusions I had arrived at a few years ago.

Before I jabber on about the little details, though, I think I'd better get the number one question settled. What exactly does the Fun Graphics Machine do, anyway? If you ask an FGM fan that question, you'll probably hear the answer "Everything!" In a sense they're right, although that isn't really very informative. The ads for FGM proclaim that it will create everything from business cards to video titles, but even that only gives a general impression of what the program itself does. Yes, it can be used to do desktop publishing. Yes, it is amazingly versatile. But what the heck does it actually *do*?

FGM is first and foremost a high-resolution graphics editor that allows users to put existing elements—text and graphics—wherever they want to for the creation a screeen image. In other words, if you want the screen to say "Welcome to our home" with a little picture of a house in the corner, FGM will let you do that. If you want the house to be a different size or the text to be written with hollowed out letters, FGM will let you do that too. Fun Graphics Machine lets you place text and graphics anywhere you want on the screen and then gives you tools to modify, adjust, distort, and alter them to create exactly the screen design you're looking for. Then, FGM will print that screen out.

So far so good. But let me note a few things about what I just said, things that will help explain exactly what FGM is and does. First of all, note that you need to have the graphics you want to use before you get going with FGM. Fun Graphics Machine is not a paint or a draw program. Secondly, FGM does printing. That's important; it's where a lot of the power of FGM lies. Let's look at that first point a little closer. FGM takes exisisting artwork and puts it to use in new ways. You can import graphic images from quite a few sources, including Print Shop graphics, high-resolution bitmaps, and even multi-color screens, and place them on the screen. Once there, those graphics can be smoothed, distorted, and changed into the image you really want. This is a lot like what Print Shop does—taking artwork and placing it on the screen—but with a much, much larger selection of tools. Also, FGM has no pre-set places where the graphics have to go, which means you are limited only by your own creativity. The graphics tools include smoothing and slanting of any size area of the screen.

The second point, the printing, comes into play once you've created a screen or series of screens. Here FGM behaves a lot like Newsroom, putting the screens you create together on a page. Unlike Newsroom, however, you have complete control over the placement of the various screens and even over the resolution of the printout of each one (which affects the area that screen takes up on a page). You can, for example, print a page made up of three screens stacked one on top of the other. You could also print a page consisting of eight screens printed in two columns of four, rather like Newsroom does. The printer drivers in FGM are superb, offering pretty much any resolution your printer can manage. Each different resolution, in other words each different number of dots per inch, results in a different sized printout, so you can fine tune your final document by adjusting the resolution of the various sections.

Fun Graphics Machine, then, is similar in m any ways to Print Shop and Newsroom. It allows you to take graphics and text and use them to create a printed document. The variety of options, however, for graphics manipulation and for printing, leave those other programs in the dust. Fun Graphics Machine will let you do pretty much anything you can imagine with graphics on a page.

I called Ron Hackley, the author of the program, and found out that there have been no major upgrades since the last copy I received, so I booted up the disk I had and dove in. When I started working with FGM again after a few years, I found myself impressed all over again. Fun Graphics Machine is an incredibly powerful program. There are options for smoothing that even

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GEOS can't match. FGM can import a multicolor screen better than any high-resolution program I've ever seen. And the options for printing are astounding. I was pleased with FGM back then, and I still am today.

All my impressions weren't rosey before, though, and as I worked with the program I realized that I still have the same concerns now that I had a few years ago. FGM is a very complicated program to use. There are several different modes of operation with almost identical functions. I assume that memory constraints were the reason for this, but that doesn't make it any less confusing. The entire program operates using keyboard combinations, often involving three keys at a time. These are not particularly intuitive in many cases; I found myself constantly groping for the manual or poring over my keyboard overlay. Granted, it didn't take me long to memorize the basic commands, but I didn't want to limit myself just to the basics. A set of onscreen drop-down menus or a movable toolbox would go a long way toward making the system easier to use, as well as making some of the more esoteric functions more accessable and easier to try out. The joystick is used to place graphics, but it isn't used to select areas of the page to manipulate, which would seem a logical job for the joystick to do. Finally, the manual, while chock full of excellent information, is daunting indeed. The introduction suggests that you use the manual as reference, reading the sections that you find you need, but since many of FGM's functions are hard to imagine until you try them, I'm not sure what will induce someone to find out about them.

Now I'm sure some of you will accuse me of being biased in what I'm saying. I stated right up front that I am a GEOS fan, and many of my complaints about FGM sound like I wish it were GEOS, with its intuitive interface and less-cluttered documentation. It's true, I do find GEOS far more intuitive and user-friendly. But Fun Graphics Machine isn't GEOS any more than it is Print Shop or Newsroom. It shares some of the characteristics of each of those other programs, true, but it is more powerful in some ways than any of them. What is unfortunate is that it's interface is difficult enough that all that power is likely to go to waste, and it's not just my GEOS addiction talking when I say that.

I asked Ron about some of this and he explained to me that he preferred to use the limited memory space of the 64 to add more features and capabilities to the program instead of such niceties as an intuitive interface. He does have a point and FGM certainly has enormous capabilities. I'm just afraid that in this day and age when computer programs are expected to be user-friendly and intuitive as well as powerful, FGM will be abandoned by users who don't care to dig through the manual every time they want to desktop publish something.

But the fact of the matter is, you can do amazing things with Fun Graphics Machine, and once you get over the initial learning curve, you'll find yourself having a ball. The keyboard overlays are a great help, and the lay-flat manual does have plenty of illustrations and examples as well as a multi-page summary of all the functions and their keyboard commands and a comprehensive index. You can import a great many types of graphics into the program and there is even a fantastic selection of clip art disks available in FGM format. The price is very reasonable, especially when compared to the price of a GEOS system with the same capabilities. On top of all that, Ron provides excellent customer support and honestly uses and enjoys his own program. When it all comes down to it, then, I can sincerely say that I recommend Fun Graphics Machine highly. Buy it. Use it. But keep in mind that it may take some time to get really going with FGM. Give it the chance, though; it's worth it.

- Steve Vander Ark

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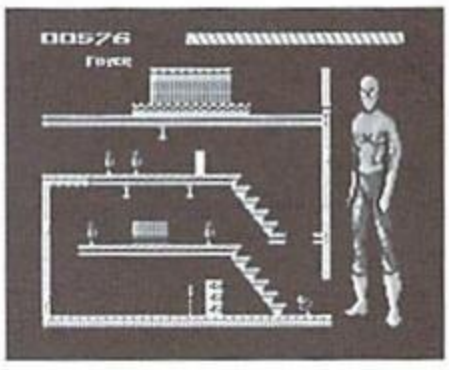
GAMES MINIVIEWS

Menace
Psygnosis
Available from CMD

Menace is a shoot-em up space game from Psygnosis, the creators of the infamous Lemmings game. Your mission, should you be brave enough to accept it, is to destroy the planet Draconia. At the beginning of game play you may choose between a normal game or an expert game. In the expert mode, collisions with the scenery will reduce your ship's protective shield. There's even a feature which toggles between relaxing space-cruising music and weapon sound effects. Menace entices you to conquer each of it's six levels for the reward of viewing the unique new graphics and aliens of the next level. To do so, you must try to defeat the waves of space creatures and kill the guardian which awaits you at the end of each level. As you travel through the game you collect weapons by defeating an attack wave. The last alien to be destroyed in the wave will turn into a bonus icon which depicts either a feature or a weapon. The features and weapons range from a 1000 point bonus to lasers and cannons to the very hard to receive full shield recovery. The graphics, music/sound effects, and unique looking creatures make Menace enjoyable! Menace is not as easy as most space games. I've played it quite a few times while preparing this review and I still haven't conquered the first level. But, I will because I just have to get to the next level to greet the next wave of awesome aliens!

- Sherry Freedline



The Amazing Spider-Man
Paragon
Available from SSI and CMD

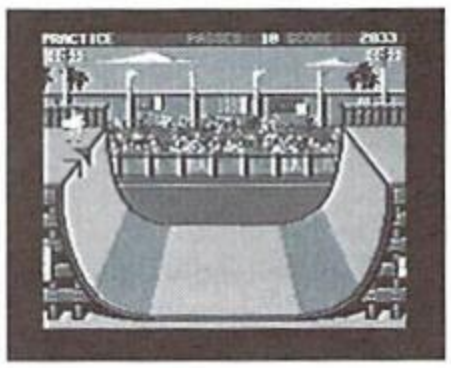
The Amazing Spider-Man from Paragon Software Corporation requires the best of your problem solving skills to rescue Mary Jane from Mysterio. Mysterio has taken Mary Jane, wife of Parker, hostage. Parker is, of course, Spider-Man. All that's been left behind is a note directing Parker to meet Mysterio at the old Rockwell Studios. Once there, Mysterio renders Spider-Man unconscious with a jet of gas. Later, Spider-Man is awakened by Mysterio's voice daring him to find his way through the studio to his secret inner sanctum where he is holding Mary Jane captive. Failure to do so will result in Mary Jane's death. And the game begins! Spidey must make his way through the studio's rooms which are divided into film sets. These film sets have been specially designed by Mysterio to make Spidey's search a challenge. The sets contain robots, electrified floors, fake doors, chemically coated walls, and upside-down and sideways gravity. Spidey's webs are useless on the walls which have been chemically coated. Spidey must climb walls and ceilings, walk, crawl, and shoot and swing from his webs on his search for Mary Jane. He must also use his best Spider sense to master the series of switches that control Mysterio's tricks. Althought the game contains 250 screens, the graphics and sound were average. But, the game play is challenging and thought provoking. The manual is very detailed and helpful. If you enjoy a good puzzle, you'll enjoy The Amazing Spider-Man.

- Sherry Freedline

Marble Madness
Electronic Arts
Available fron SSI and CMD

Marble Madness is a maddeningly addictive arcade game for one or two players from Will Harvey and Electronic Arts. The object of the game is to roll the marble to the goal line. Sounds simple, right? Well, it's far from it! If you are playing the one player version, you must compete against a clock. Complete a level before time runs out and the remaining time is added to the time in the next level. In the two player version, the game becomes a race to the goal line between you and your opponent. Throw in a 3-D terrain with marble-hating creatures such as Steelies, Pounding Hammers, and Marble Munchers and you've got quite a challenge on your hands. Steering the rolling marble downhill in a straight and narrow path is by no means an easy task. Gravity adds to the difficulty of the game. It influences the marble's movements just as it would in real life. The game can be played with either a joystick or trackball. And after a brainstorm, I found it even works with CMD's new SmartMouse! The SmartMouse provided extra steering flexibility for all those close corners in the game. Marble Madness contains six different levels each containing their own musical score. The colorful graphics are, of course, excellent just as we've come to expect from Electronic Arts. The manual consists of a small sheet of paper with the necessary loading information. But then, that's all you'll need as the rules and object of the game are quite simple. Now, there's only one remaining question... Can you complete this game with all YOUR marbles intact?

- Sherry Freedline



Skate or Die
Electronic Arts
Available from SSI and CMD

Skate or Die: It's "RAD"...it's "BAD"...it's a must-have classic from Electronic Arts! This is by far one of the most enjoyable games I've played by the folks at Electronic Arts. What makes this game so fun? Well, to begin with, the colorful graphics and music are fantastic! The punk rocker characters of Poseur Pet, Aggro Eddie, and Lester provide various

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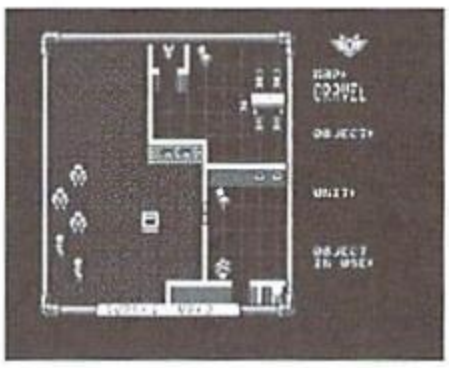
levels of challenge as opponents on those lonely days. But, for those days when you have a full house, Skate or Die can accommodate up to eight players! Skate or Die features five far-out events for you to show off such skateboard feats as Kickturns, Rock-n-Rolls, Footplants, Ollie Airs, and Aerials. What? You don't know how to do these stunts? Never fear, detailed instructions are provided in the rad manual. You can choose to practice or compete with these skills in the Pool Joust, Downhill Race, Freestyle Ramp, Highjump Ramp, or a Downhill Jam. This article is way to brief to go into the all the different available events so I'll just tell you about my favorite one. The Downhill Race is the best event to start out in. There is no competition but a clock. The goal of this event is to complete the course within one and half minutes. Extra points are awarded for skating over, under, and through the different obstacles along the course. If you've got the courage you can attempt to skate through a pipe, jump grates and wooden horses, or even take a leap from a ramp and attempt to land in an upright position. But, even if my favorite event doesn't seem to interest you, there are still four more events to choose from. One of them is sure to leave you as punk as Lester and his friends!

- Sherry Freedline



Laser Squad

MicroIllusions

Available from SSI and CMD

Microillusions' Laser Squad is a one or two player action/strategy game. The Laser Squad is a team of the galaxies' best fighters specializing in weapons, maneuvers and infiltration. They exist solely to solve the most impossible of missions! The game is played by you and an opponent, computer or friend, taking turns controlling your unit of humans, droids or other creatures. Each member of your unit is allocated a number of Action Points. The number of Action Points determine the amount of activity a unit member may perform during a turn. Activities may include movement, combat actions, and object manipulation. Each action decreases the number of Action Points. The player ends his turn when all the Action Points for each unit member have been used. The other player then takes his turn which is hidden from his opponent. If a friend is your opponent, the screen must be hidden from the other player during each turn. The first side to acquire 100 Victory Points wins the game. These points are won in various ways depending on the scenario you are playing. Eliminating enemy units or destroying certain installations are a few ways to obtain Victory Points. Microillusions has packed the game with five different scenarios. Besides a unique new cause to fight for, each of the scenarios contain excellent graphics, varying skill levels and require different time frames to complete. Fortunately, games in progress may be saved to disk for completion at a later date. Laser Squad is not a game to be played right out of the package. Reading the detailed manual is imperative along with a few practice games. But the rewards are rich. In no time at all you'll be so deeply engrossed in planning your strategic moves that you'll find yourself losing track of the time and day.

- Sherry Freedline

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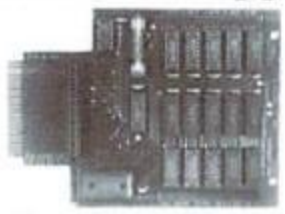

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HARDWARE IN REVIEW

Boca 144EW Fax/Data Modem

Product: Boca Research M144EW 14.4Kbps Fax/Data Modem
Firmware: v1.410-AS29 (ati3)
Data Pump: 144DPi Rev CA (ati6)

Primary Features

FAX: Group III, Class 1 & 2, V.17, V.27ter, V.29 and V.21 modes (14,400 to 300bps)
DATA: V.32bis (14,400bps), V.32 (9600bps), V.22, V.22bis (1200/2400bps), Bell 212A (1200bps), Bell 103 (300bps).
ERROR CORRECTION: V.42 and MNP2-4
DATA COMPRESSION: V.42bis and MNP5 for up to 57,600bps throughput.

Boca modems are made in the U.S.A., and are covered by a 5 year warranty.

Appearance & Package Contents

The modem is housed in an attractive, low profile, black anodized texture type case (7.5" x 5.5" x 1.1"). The front panel has an array of eight LED indicators which show the status of the following lines and conditions:

TM - Test Mode
AA - Auto Answer
HS - High Speed
OH - Off Hook
SD - Send Data
RD - Received Data
TR - Terminal Ready
CD - Carrier Detect

The rear panel has two RJ-11 phone jacks, a power switch, and a 25 pin RS-232 port. The modem is securely packaged in a 16.5" x 4" x 6.5" box along with a 78 page manual, an RJ-11 phone cable, the AC power adapter, a 9-pin to 25-pin cable, a 9-pin to 25-pin adapter (allows use on both 25 and 9 pin RS-232 ports), and an IBM MS-DOS and Windows FAX program on 3.5" HD disks. Introductory software for commercial on-line services is also included.

Equipment Used for Testing

Computers: Commodore 128 with SwiftLink-232 high speed serial cartridge interface, Commodore 128 with an Omnitronix RS-232 interface, Commodore Amiga 1200, Atari 800 XL, and an IBM PS/1.

Other modems used: Universal Data Systems 1200, U.S. Robotics Sportster 14.4Kbps, Telebit PEP 2400, Supra 2400, SupraFAXmodem 9600Kbps, SupraFAXmodem 14.4Kbps, USR Dual Standard HST.

Software used: Omni128 BBS, Desterm 128 v2.0, Dialogue 128 v2.2 on the C-128, JrComm 1.02, GPFax on the Amiga, Bobterm for Atari 800xl, QModem Pro for the IBM PS/1.

Operating Tests

It was with great anticipation that I connected the Boca 14.4 to my 128/SwiftLink setup, as I needed to find the correct modem settings for use with my BBS software (other sysops also were anxiously waiting for the proper setup).

First, I put the modem online in a simple terminal and reset the modem to it's defaults via at &f &c1 &d2 &r1. Then, I sent some commands which are used to set up a Supra modem (another Rockwell technology modem) for my software.

I "called" the Boca from another computer and terminal using all the standard baud rates and error correction and compression modes to see what kind of responses it gave. All responses matched those shown in the manual, and were similar to the SupraFAXmodem, so I set about to try running my BBS with it.

On the first attempt at calling the BBS, something was obviously wrong. I made it back into the BBS terminal mode to check the modem. The "at&v" command revealed some registers had changed. I attributed this to the initial power up cycle. After restoring the modem to its defaults via at&f and setting a few of the other registers to emulate the Supra's programmed responses, I was in business! From that point, I was able to test drive the modem on my BBS for several weeks, and also develop some other strings for use in the network section. Operation as the BBS host modem was very reliable, and better than the Supra in a few ways:

- Connect times for "direct" modes (such as 2400 direct) were between 5 and 7 seconds faster (than my SupraFAX 9600). This includes 4800 and 9600 direct.
- The modem runs very cool to touch. Even in 80° F ambient temperature, the modem was barely lukewarm, sure signs of a low-power consumption chipset and long-term reliability.
- Download transfer times at 14.4Kbps were often over 100 CPS (characters per second) faster than my U.S.R. Sportster. Downloading from my BBS using Ymodem-g yielded 1389 CPS, and from high speed Amiga systems, up to 1650 CPS!
- Some modem types, such as one of the two UDS 1200's which would not connect to the Supra at all, had no problem linking up with the Boca M144EW.

Error Correction & Compression

Error correction protocols were designed to capture and eliminate interference present on the phone line. In the Boca, those used are MNP 2 through 4, and V.42. Their operation is generally transparent to the user.

Compression protocols are quite different, and were designed to increase the throughput between the computer and modem at either end of the line. The Boca supports MNP-5, and V.42bis compression. MNP-5 is the lesser used of the two, and has the potential to double throughput on text and similar un-crunched data, but will actually slow down a transfer if compressed files are sent. V.42bis, on the other hand, is intelligent enough to disable it's compression mode if dense data is encountered, and turn it back on when appropriate. Many modem manuals recommend not using error correction or compression unless a streaming protocol such as Zmodem or Ymodem-G is to be used—the reason being that it would be

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redundant to error check the same data twice. Of course, the Boca modem provides several ways to disable such connection types (Note: Error correction and compression can also adversely effect the handshaking methods of some protocols; Punter is a prime example, which may or may not synchronize with V.42bis or MNP-5 depending on the baud rate, phone company packeting system, or other arcane factors). In practice, you will get the fastest transfer rates with direct, or "normal" connections at any baud rate, unless you are transferring text.

Conclusions

The Boca 14.4Kbps is a well engineered unit, with enough configuration possibilities to fulfill any requirements from the simplest of terminals to advanced customized BBS's. Although I could not test the FAX options with my SupraFAX software, I have no reason to doubt it works with the supplied programs under DOS and Windows.

- Brian Bell

Speed Tests

Though the results can vary widely depending on line conditions, computer type, drive type, software, and interface type, these tests should help give you an idea of what to expect when using the Boca as a host modem.

Host: C-128 w/SwiftLink-232, running Omni128 BBS
Term: Amiga 1200, JRComm 1.02
Test File: Text.txt (76,800 bytes)

Downloading at 14.4Kbps

Protocol	V.42bis CPS	Direct CPS
Ymodem-g	1386	n/r
Ymodem-1k+pre-ack*	1385	1381
Ymodem-1k+plain ack	1070	875

Downloading at 2400bps

Protocol	Direct CPS
Ymodem-g	n/r
Ymodem-1k+pre-ack*	240
Ymodem-1k+plain ack	216
Punter	163 - 170
Xmodem Checksum	187+
Xmodem CRC	182

*Note: pre-ack is a custom type of X or Ymodem handshake which is fast, but it cannot recover if an error occurs, similar to Ymodem-g.

The Boca 2400

Easy and Reliable Telecommunications

Writing about something complicated is easy—there's a lot to write about. Not so with something that just plugs in and is easy to use! The Bocamodem 2400 (Boca 2400 from here on) is sturdy, compact, and ideal as a first modem or as an upgrade from 300/1200 baud modems.

Hardware Connections

First, lets deal with the only "difficult" part—that of connecting the modem to the computer. The Boca is designed for use with all computers, and as such, Commodore 64 or 128 users will need either an RS-232 interface (such as the Aprotek Com-Modem adapter, or a SwiftLink cartridge). The interface allows the computer and modem to communicate with each other correctly. Actually the interface is the hardest part to write about, though not because they are complicated—far from it. You just plug one end into the User Port and the other end connects to the modem with a cable (usually a DB-25 pin serial cable). The cable doesn't come with the modem, and usually doesn't come with the interface, either, so you will have to buy one separately. The hard part is finding an RS-232 interface—most I've found have been used! Taking a quick look at various catalogs, the Aprotek adapters are available commercially and of course the SwiftLink cartridge is available from CMD. While I don't want it to appear that I'm promoting Creative Micro Designs products in their own magazine, there is some logic to using a SwiftLink—even with a 2400 baud modem. You see, SwiftLink is easy to find commercially, and you don't need a science degree to use it; and if you later decide to buy a faster modem, you'll already have what you need to get the higher speeds. The cable needed for SwiftLink has a DB-25 male connector on one end, and a DB-9 female on the other end.

There! The hump is over—the modem is connected to either an RS-232 interface or a SwiftLink cartridge, which is connected to the computer. Taking a look at a pamphlet for PC users that comes with the Boca 2400, however, makes me appreciate that we Commodore users have it easy when it comes to modems. In big bold letters the pamphlet states: "READ ME FIRST!"; it then explains in detail how to connect the modem to the PC, which sounds much more difficult than finding an interface and plugging it into our Commodore 64 or 128 computers.

Connecting to the World

Once I had the Boca 2400 plugged in and ready to be used, I loaded my term program and found that the term thought the modem was already online, as if I had connected to a BBS already. This is fairly common with new modems, so it didn't phase me. Some come pre-set at the factory configured in a certain way, on of which is the exact opposite for what we needed. I simply used the standard Hayes AT commands and while in terminal mode typed: AT &C1 &D2 <RETURN> which caused my term program to realize I wasn't on-line. So I wouldn't have to deal with this again, I typed AT &W, which saved my changes to the modem's memory. This was as "technical" as I had to get with the Boca 2400, as I simply set my term program to dial at 2400 baud, dialed, connected, and checked out what was new on the various bulletin boards with it. Regardless of which term program I used or what bulletin boards or online services I dialed, I had the same results: fast, easy connections, and reliable data transmissions. Aside from changing the Data Carrier Detect (AT &C1) and the Data Terminal Ready (AT &D2), I didn't have to change any of the other AT or S-Register settings which are listed in the back of the manual.

One of the things that genuinely surprised me about the Boca 2400 is its size. I have a Hayes Smartmodem which is about 9 1/2 inches long. The Boca 2400 is about half that length, although it's the same width and height as the Hayes. The Boca 2400 comes with a phone cable, an AC Power adapter, a small but informative and well laid out manual, and a 5 year warranty. Also included are two 3.5 inch disks for PC users, one to connect to America Online, and the other one is a terminal program for PC users. If you happen to have a 1581 or an FD disk drive, these can be formatted and used for your own purposes. A couple of special offers also come with the Boca, with information on joining GEnie and CompuServe, both of which have Commodore support areas. The special offers are something that seem to be packaged with every new modem regardless of modem brand, however, so I certainly wouldn't let this affect my decision in buying a modem.

The advertising on the box and manual proclaim, "High Quality, Affordable Communications". On this, I tend to agree. Whether you're looking for a modem to begin exploring the world of telecommunications, or want to step up from 300 or 1200 baud, the Boca 2400 is an excellent choice.

- Les Songa

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Graphic Interpretation

by Steve Vander Ark

IMPORTING & EXPORTING GRAPHICS WITH GEOS

I spend a lot of time with GEOS. You might say that I'm a GEOS addict. I certainly don't leave the GEOS environment without an awfully good reason, and thanks to all the wonderful applications and add-on utilities available for the system, I don't usually have to. I have a word processor that has as many features as any other I might find, a paint program that can't be beat, and a fairly good term program (well, okay, so that's the weak link; but hey, it works!). Anyone reading my columns the last few years is bound to have noticed that I'm a graphics and desktop publishing fan. And let's face it: GEOS is the way to go when it comes to those kinds of projects.

I realize, of course, that there are other types of programs out there that people are using every day, and there are plenty of decent Commodore programs to create graphics. Programs like RUN Paint and Koala Painter actually use a different graphics mode to allow for very rich multi-color graphics. For shear ease of use, the Print Shop program, along with Print Shop clones like The Flintstones Print Kit, offer quick and easy desktop publishing as well. Computer bulletin boards hold lots of graphics in Print Shop mode, available for the price of the download.

A lot of folks are also using computers like the Amiga, the Macintosh, or the IBM-clone. There are plenty of wonderful graphics programs for those machines too, programs with immense power. They use graphics in many forms, and those graphics are also available for downloading.

I still use GEOS, though—both on my Commodore and on my IBM clone. One of the reasons that GEOS can serve my needs so well is

that, if I want to, I can tap into a lot of those graphics out there that are intended for all those other programs and machines. That is a power that keeps GEOS going in this era of 32-bit machines and multimedia. This capability to import so many other graphic formats didn't come built into GEOS, however. You have to pay a little extra here and there. But it sure is worth it. Over the next two columns, I'll talk about some of these graphic modes and formats. Then I'll talk about some of the conversion programs you'll need to import those images into your GEOS environment. This issue I'll cover graphics created for and by other Commodore programs; next issue I'll take a look at some of the other graphic formats you're likely to encounter, and tell you what you'll need to bring them into GEOS.

I used to say that there were essentially three graphics modes for the Commodore, but with the advent of BASIC 8 and I-Paint, that statement is a bit out of date. For starters, though, let's go back to the basic three modes. The first is text mode, which is the way your Commodore boots up. What you see on the screen is essentially pre-defined characters in the shape of letters, numbers and symbols. Each shape comes out of the computer's permanent memory and is therefore drawn very quickly. It's possible to divert the computer's attention to a set of shapes you define yourself, but the basic dimensions of each shape are always the same. Things look pretty blocky in this mode, but since it's most often used for text or simple lines, that's okay. Text mode is often referred to as "low resolution" mode.

The second graphics mode, referred to as "medium resolution" or "multi-color" mode, offers a little bit more in the way of color. Its screen resolution suffers a little, but this limitation is offset by its more powerful color capabilities. Some of the finest artwork ever done on a Commodore computer were done in multi-color mode. The KoalaPad graphics tablet used this mode for its excellent paint program, KoalaPaint. Multi-color images are commonly stored in KoalaPaint format, sometimes compressed. If the filename begins with an inverted spade symbol, the image is in Koala format; if it begins with "GG" the image is in compressed Koala format.

The third graphics mode is called "high resolution" and it allows the finest detail of all but at the cost of some limits on colors. Many programs operate in high-res mode, including GEOS, Print Shop, and Doodle. Doodle format is something of a standard for high-res images. A file with a name beginning with "DD" is a Doodle

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file, while one with a filename beginning with "JJ" is in compressed Doodle format. Print Shop, Print Master, and Newsroom each have their own formats for storing high-resolution clip art images.

The graphics you might want to use in GEOS, then, have to be in a high-resolution format to be used directly by geoPaint. If they aren't already in high-resolution format they'll have to be converted. Here's a list of the programs that will do the work for you:

Graphics Grabber (on the Deskpack Plus disk from Creative Micro Designs) This is the "official" graphics conversion program for GEOS. It will import graphics in the formats used by Print Shop, Print Master, and Newsroom. The interface is very easy to use; it even allows you to select from a dialog box with a double click instead of having to select and then go find an "open" button. If you have Print Shop graphics that you would love to use, this is the easiest way to import them into GEOS. Graphics Grabber works fine in 40- or 80-column modes, too.

Import Runner by Joe Buckley (on the RUN Power Pack II disk distributed by Creative Micro Designs) Import Runner will capture the following types of Commodore images: standard bitmaps, standard and compressed Doodle images, and standard and compressed Koala multi-color images. Since the color information in multi-color images is incompatible with GEOS format, Import Runner substitutes GEOS patterns for the colors to create a monochrome version of the picture. Each conversion can be done into a photo scrap or into a geoPaint file.

Graphic Storm by Joe Buckley (available as shareware: $3.00) Graphic Storm is similar to Import Runner, probably since it was written by the same guy. It works pretty much the same, although it handles a somewhat different list of graphics formats. Along with standard bitmaps and uncompressed Doodles, Graphic Storm will import Print Shop, Print Master, and Newsroom graphics.

Handy Import by Joe Buckley (available as shareware: $5.00) The Handyscanner creates images in high-res but saves them in its own format. This import program, also written by Joe Buckley, pulls the scanned images into GEOS. This program will also convert graphics from the Video Digitizer distributed by RIO Computers.

GetGraphic by Nicholas Vrtis (available as shareware: $5.00) If you have a lot of Print Shop graphics you'd like to import into GEOS, this program will make your day. GetGraphic will convert entire disks of graphics into scraps in photo albums, all automatically. You can even specify which graphics on a disk the program will take.

Scrap It! by Michael Schell (shareware: donation to Cystic Fibrosis Foundation, Maryland Chapter) This program converts between various formats, including both multi-color and high-res types. The conversions include color, even when the beginning image is a multi-color. Conversions from Koala images into color geoPaint images are sometimes quite spectacular; results really depend on how well the colors of the original happen to match up to the requirements of a high-res image.

The above programs let you, the GEOS user, take advantage of the large collections of graphics available for the Commodore. There's no need to limit yourself only to Commodore graphics, however. Next issue we'll expand our horizons to cover the whole wide world of computer graphics!

COLOR 64 BBS

THE COLOR 64 BBS SYSTEM, one of the most sophisticated BBS systems for the Commodore 64 computer, has always been built to be functional when first installed yet completely modifyable by the SYSOP. Now we are proud to announce the release of version 8.0, the latest form of the BBS system that is popular with both beginner and advanced Sysops.

In its stock form Color 64 supports: 300 to 2400 BPS; up to 38,400 BPS with CMD's SwiftLink; Hayes compatible modems; Commodore or compatible disk drives; CMD HD Series, Lt. Kernal and ICT hard drives; IEEE drives; Commodore REU's up to 2 MB; CMD's RAMLink and MORE. A minimum of 1300 blocks of disk space is recommended as well as some form of disk drive speed enhancement such as CMD's JiffyDOS, Skyles Flash Interface or fastloader.

Color 64 also features: upload and download directories; Punter and Xmodem protocols; an advanced public message system; a full featured message editor; built-in MCI commands for message formatting; 40 and 80 column support; an automatic page pauser; Commodore graphics and color; ANSI graphics and color; Built-in terminal program with phone book; Built-in networking with networked mail, public messages, and file transfers.

More information about Color 64 BBS can be obtained by contacting the SYSOP of the Sonic Temple BBS at 410-285-0428. You can also send GEnie mail to F.OGLE, Inet/Usenet mail to F.OGLE@GENIE.GEIS.COM or U.S. Mail to Fred Ogle, P.O. Box 35427, Dundalk, MD 21222-7427. Send all orders via Mail.

Pricing for Color 64 Version 8.0, a four disk set with documentation: the cost is $65.00. Postage/handling charges: US Mail 3rd Class add $2.00 (Surface), US Mail 1st class(Air) add $3.00, Priority Mail (2nd Day) add $4.00, Express Mail (Next Day) add $15.00. U.S. funds only, checks or money orders accepted. Canadian orders add $5.00. Prices and features are as of 3/13/94 and are subject to change.

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geoProgrammist

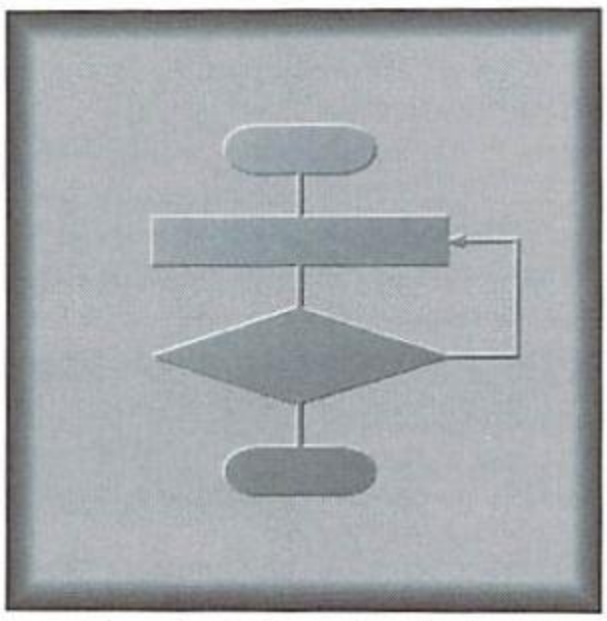
By Maurice Randall

OH, NO. MACROS TOO? DEALING WITH GEOS PROGRAM MEMORY

The very thought of the word 'macro' scares people. Most people tend to avoid any use of a macro. But what exactly is a macro? Well, macros can be different things on different computers or different programs. A word processor, for instance, might define a macro as being a single press of a particular key that will perform the same functions as if you pressed several keys, therefore saving many keystrokes. This would mean that instead of having to remember all those different keystrokes, you only have to remember one. After all, computers are supposed to save us time and trouble, right? We let the computer remember all of the needed keystrokes. So, in a sense, a macro can be defined as anything that appears as being simple and is simple to use, but performs something more complex when put to used. In our case, we are working with geoAssembler and this is a type of program that doesn't need to accept any input from the user through the keyboard. It receives all of it's input from text files that we create with geoWrite. In simple terms, a macro for geoAssembler is a word contained within your source code that, when assembled, is converted into source code. This saves on typing when you're creating your source code. A macro name is also easier to remember than the actual code generated by the macro.

A Closer Look

Supplied with geoProgrammer is a file that contains a standard set of macros already defined for you. You will find yourself using some of these macros all of the time. Let's take a look at one of the most commonly used macros known as 'LoadW'. This macro is designed to load a two-byte (word) location in memory with an



immediate value. Let's put the value $a000 into the zero page location at $02. First, here's the long way to do it:

```
lda #$a0
sta $03
lda #$00
sta $02
```

That small piece of code required me to type four lines. Later on, while debugging the program, a quick glance at this part of the code might not be real evident what my intentions were. Am I just putting some values into a couple of zero byte locations, or am I setting up a register so that I might be able to use some indirect addressing such as 'lda ($02),y'? Let's try this with a macro.

```
LoadW $02,#$a000
```

Now, that's better. One line of source code and I know why I put those two values into $02 and $03. I was setting up so that I might be able to do something directly with the 40-column screen memory which begins at $a000. That would help me to figure out what the remaining code in my routine was doing. Obviously the macro name 'LoadW' is not used all by itself. It requires two parameters. In the above example, my two parameters were $02 and #$a000. The first parameter is always a location in memory while the second parameter is the value that you wish to have placed in that location. Just as in the example, the two parameters are separated by a comma, and the two parameters must follow the macro name itself by at least one or more spaces or tabs.

The Standard Macros

LoadW is one of the standard macros that is supplied in the geosMac file that comes with geoProgrammer. There are a number of other macros in this file that you will use, while some of them you may never have a use for. LoadB is a macro that is similar to LoadW, except that it will place a value into a one-byte location in memory. Have you ever typed in the code to subtract a value from a memory location? Instead, just use the macro 'SubVW'. SubVW stands for 'Subtract Value from Word'. Let's say that you have a two-byte value contained in $02 and you wish to subtract the decimal value 1000 from it, with the result ending up in location $02. It's as simple as:

```
SubVW #1000,$02
```

Of course, if you don't like the thought of macros, you could always type in the following:

```
sec
```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```
lda $02
sbc #232
sta $02
lda $03
sbc #3
sta $03
```

I think I'd rather use the macro.

GeoAssembler will take care of writing out the actual code for you when it is assembling your source code. Looks pretty simple doesn't it? You can even use constants that have been defined elsewhere in your code. The constant 'r0' is defined in the symbol file 'geosSym' and you should always '.include' this file in your source code. So, different parts of your source code could have the following lines in it:

```
.include geosSym
TABLESIZE =1000
SubVW #TABLESIZE,r0
```

Defining Your Macros

GeoAssembler needs to know how your macros are defined. The definitions are not built into the assembler. There are two ways to do this. The easiest way is to just include the macro file at the start of your source code. The other way would be to type in the macro definition at the start of your source code. This is fine for a macro that might only be used in this one file. If you wish to use the macros from the geosMac file, just type in the following line at the start of your source code:

```
.include geosMac
```

GeoAssembler will read in this file at the start of assembling your source code and will know what it needs to do when it encounters any macros that you have used in your code. Load the geosMac file into geoWrite and study some of the macro definitions. This is the easiest way to become familiar with how a macro is defined. You can also add your own macros to this file, or delete the ones that you will never use. GeoAssembler only has a certain amount of room for reading in macro definitions, so if you add more macro definitions you might exceed the amount of space reserved. Just take your mouse and highlight a definition that you would not need and cut it from the file. You will know if geoAssembler runs out of room for macro definitions, it will report the error during the assembly. A macro definition always starts with '.macro' and ends with '.endm'. Let's look at the macro definition for the very popular 'bra' macro (this, by the way, stands for BRanch Always) and see how a simple macro is defined:

```
.macro
   bra address
   clv
   bvc address
.endm
```

This particular macro requires one parameter, a local label. When encountered, your code will always branch to that local label. In the definition, after .macro, comes the name of the macro. This is followed by any parameters that the macro should use which are separated by commas just as when you use the macro in your source code. Then, beginning with the next line is the actual code that geoAssembler will substitute for your macro. The definition ends with .endm. Macros do not make your final program any smaller. In fact, in some cases, using macros could actually make your program larger. For this reason, a macro definition should not result in a large amount of code. Large macros that require parameters are okay, but a large macro that doesn't require a parameter and only results in the generation of code should be avoided. A jsr to a subroutine would be more logical in this case. Macros can be quite complex as you can see from some of the definitions in geosMac. But even the very simple ones can be extremely helpful. Start out by using the macros that I talked about here and when you feel comfortable, explore the many possibilities that you might have with this very powerful feature of geoAssembler.

Popular Macros from the geosMac file...

LoadW this will store an immediate value into a two-byte address. Example: LoadW rØ,#Table This would store the value defined by the symbol Table at the two-byte memory location known as rØ.

LoadB this will store an immediate value into a one-byte address. Example: LoadB r11L,#1ØØ This would store the value 1ØØ into the location defined by r11L.

MoveW use this to move the contents of a two-byte address to another two-byte address. Example: MoveW rØ,r1 The two consecutive bytes beginning at rØ will be copied into the two consecutive bytes at r1.

MoveB use this to move a one-byte value from one address to another. Example: MoveB r2H,bottomSave This would move the value contained in r2H to a location called bottomSave.

PushW push two consecutive bytes from memory onto the stack. Example: PushW rØ This will push the two bytes beginning at rØ onto the stack. The high byte (rØ+1) is pushed first.

PopW pull two consecutive bytes from the stack into memory. Example: PopW rØ This will pull two bytes from the stack and place them at rØ and rØ+1. The first byte pulled will go to rØ.

AddVW add a value to a two-byte location in memory. Example: AddVW #32Ø,screenrow This would add the value 32Ø to a two-byte location in memory that you have defined as screenrow. The result will be left in screenrow.

SubVW subtract a value from a two-byte location in memory. Example: SubVW #32Ø,screenrow This would subtract the value 32Ø from a two-byte location in memory that you have defined as screenrow. The result will be left in screenrow.

bra branch always to a location in memory. Example: bra 1Ø$ This will branch to the local label defined as 1Ø$.

bbr branch on a bit in memory if reset to zero. Example: bbr 3,testFlags,4Ø$ This example would test bit 3 of the byte at testFlags, and if it is zero (cleared) will branch to the local label 4Ø$. Otherwise, the program will continue with the code that follows the macro.

bbs branch on a bit in memory if set. Example: bbs 1,testFlags,2Ø$ This would test bit 1 of the byte at testFlags, and if it is a one (set) will branch to the local label 2Ø$. Otherwise the program will continue with the code that follows the macro.

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BASIC INSTINCTS

STARSHIP COMBAT PART III: THE ALLIANCE STRIKES BACK!

COMBAT - THE ALLIANCE LEARNS HOW TO USE ITS WEAPONS
SCANNERS - TRACK SHIPS THROUGHOUT THE SECTOR GRID
CLOAKING - ALLIANCE SHIPS LURK IN THE SHADOWS

by Gene Barker

IMPORTANT: *Please see the notes on entering this program located just before the listing before you actually start typing the listing into your computer.*

Newcomers

In BASIC Instincts, we are building a large game named Starship Combat which spans across the last five issues for this year. This is the third installment of the series. Starship Combat is a science fiction strategy game written in Commodore BASIC v2 for the Commodore 64. In the process of building Starship Combat, we are developing our BASIC programming skills. Best of all, we're having fun doing it!

Although this column was initially intended for beginning BASIC programmers, we've moved quickly into a more intermediate level of BASIC programming. Nonetheless, beginning and experienced BASIC programmers are encouraged to follow along as well, and review Starship Combat's advanced use of subroutines, strings, and arrays.

What? You don't have the last two installments. Solution: Break open that piggy bank, grab some quarters, and pick up issues two and three. While you're at it, hold off on that pizza you were thinking about ordering tonight and send in the dough for a subscription.

Notes

Starship Combat is a large BASIC program. As you type in Starship Combat, take it one section at a time. Read the comments for the section both in the article AND in the BASIC text. Try to get a general idea of what the section is accomplishing. See if you can follow how the section is using its variables (use the handy charts and variable definitions from issue two). If you see an unfamiliar BASIC statement, take a quick look at it in your BASIC manual. If you are still confused, move on to the next section; often times the next section helps explain the previous one. Above all, don't forget to BACKUP your work frequently!

About Installment Three

In this installment we will focus on enabling the Alliance's weapon systems. The challenge will be making the computer a worthy opponent for the Union. To make it interesting, we will outfit the Alliance with a cloaking device! Furthermore, we will limit the Union's ability to track Alliance movements. After making these changes, Starship Combat will be a functional strategy game. The last two installments of Starship Combat will focus on additional features and enhancing gameplay.

As a bonus, we'll make fun of Gene for using a poor method in a couple of his FOR/NEXT loops in the last installments. We'll look at why it was a poor method, then pull out our BASIC tool box and fix them.

Items

In the last installment we added an Item List to the Ship Type array (TY%) fields (7), (8), (9), and (10). The Item List is a list of items found aboard that particular ship type. Let's take a look at the item definitions (please see the Item Chart).

ITEM CHART

Item	Name	Definition
0	Basic Scanner	Scans sector map for ships
1	Deep Scanner	Scans sector map and ID's enemy ships
2	Energy Stealer	Steals energy from opposing ships
3	Shield Kit	Partially regenerates shield strength
4	Cloaking Device	Allows ship to travel undetected in sub-space
5	Generator	Generates energy for the ship's energy reserves
6	Sensor Array	Used to detect cloaked ships
7	Atomics	Destroys everything in the sector (including you)
999	No Item	Used for initialization purposes

The Basic and Deep Scanners are the only items operational for the Union at this time; where the Alliance has operational Energy Stealers and Cloaking Devices. We will deal with the rest of the items later as the series continues in the next two issues.

Scanners

As of this installment, Starship Combat does not inform you of Alliance moves unless (a) the Alliance ship is not cloaked and (b) a Union ship is present in the sector. So to find out more about the enemy you must use a scanner. At the moment, the scanners are accessed through the "(u)use item" command.

Both the Basic and Deep Scanners allow viewing of the entire sector grid. The Deep Scanner provides uncloaked enemy ship ID's as well as their location; where the Basic Scanner only provides the location. Additionally, if the current ship has a Deep Scanner you can view any ship which is not cloaked in the game.

The routine which implements these two "scans" is surprisingly small. It just walks through the Active Ship List array SL% and pokes the uncloaked ships to the map area. But how do we know if a ship is cloaked? Read on...

Cloaked Ships

In order to add the cloaking ability, we must find a way to mark that a particular ship is cloaked. You guessed it. We need to add a new field to the Active Ship List array SL%.

SL%(SH,10) = 0 - ship is not cloaked
SL%(SH,10) = 1 - ship is cloaked

Since more than one ship can cloak at a time, each ship must have its own cloak flag. The Active Ship List array is the perfect way to implement this. As you code in this change, notice how simple it really is. We just change the size of the array in the DIM statement and we're done (we change the nine to a ten).

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Making The Computer Think

Now we need to teach the Computer how to fight. Tall order? Maybe. But before we even think about touching the keyboard, WE MUST DEFINE HOW WE WANT THE COMPUTER TO ACT. By defining what we want to do on paper in detail we can anticipate problems, identify better methods of attacking those problems, and SAVE A GREAT DEAL OF TIME. There's nothing worse than discovering that you must trash the last couple hours of work because you didn't foresee some problem. Enough lecturing, let's define how we want the computer to use each of the Alliance ship types. Please take a look at each ship's algorithm in the ALGORITHM CHARTS.

ALGORITHM CHARTS

AL HUNTER ALGORITHM

```
IF no UN Ships in the sector THEN
   IF ship is badly damaged THEN effect repairs
   ELSE seek enemy sector
ELSE (UN Ships in the sector)
   IF ship is badly damaged THEN run away
   ELSE
   IF power<100 THEN steal energy
   ELSE IF torpedo ready THEN launch torpedo
   ELSE IF phasers ready THEN fire phasers
   ELSE steal energy
   END_IF
END_IF
```

AL DESTROYER/FRIGATE ALGORITHM

```
IF no UN Ships in the sector THEN
   IF ship is badly damaged THEN effect repairs
   ELSE IF cloaked THEN seek enemy sectors
   ELSE cloak
ELSE (UN Ships in the sector)
   IF ship is badly damaged THEN
   IF cloaked THEN run away
   ELSE cloak
   ELSE
   IF not cloaked
   IF range<9 AND torpedo ready THEN launch torpedo
   ELSE IF phasers ready THEN fire phasers
   ELSE cloak
   ELSE (cloaked)
   IF mp's>2 THEN uncloak
   ELSE IF range>1 THEN close in
   ELSE wait
   END_IF
   END_IF
END_IF
```

AL LIGHT CRUISER ALGORITHM

```
IF no torpedoes left THEN use AL DESTROYER routine
ELSE (torpedoes on board)
   IF no UN Ships in the sector THEN
      IF ship is badly damaged THEN effect repairs
   ELSE IF cloaked THEN close in
   ELSE cloak
   ELSE (UN Ships in the sector)
   IF ship is badly damaged THEN
   IF cloaked THEN run away
   ELSE cloak
   ELSE
   IF not cloaked
   IF range<7 AND torpedo ready THEN launch torpedo
   ELSE cloak
   ELSE (cloaked)
   IF range>4 THEN close in
   ELSE IF mp's>4 THEN uncloak
   ELSE IF range>1 THEN close in
   ELSE wait
   END_IF
   END_IF
   END_IF
END_IF
```

AL HEAVY CRUISER ALGORITHM

```
IF no UN Ships in the sector THEN seek enemy sector
ELSE (UN Ships in the sector)
   IF torpedoes on board THEN
   IF range<5 AND torpedo ready THEN launch torpedo
   ELSE IF phasers ready THEN fire phasers
   ELSE IF range>1 THEN close in
   ELSE wait
   ELSE (no torpedoes left)
   IF phasers ready THEN fire phasers
   ELSE wait
   END_IF
END_IF
```

AL DESTROYER/FRIGATE (Modified Version)

```
IF F1=0 THEN
   IF F3 THEN effect repairs
   IF F2 THEN seek enemy sector
   cloak
ELSE
   IF F3 THEN run away
   IF F2=0 THEN
   IF range<9 THEN GOSUB launch torpedo
   GOSUB fire phasers
   cloak
   ELSE
   IF mp's>2 THEN uncloak
   GOSUB close in
   wait
   END_IF
END_IF
```

Wow! That's a bunch of code. How can we squeeze those IF/THEN statements down to a more reasonable size? Ah, now the magic begins. First we notice that many of the IF/THEN checks are the same in each algorithm; only their locations are different. For example each algorithm must check whether there are Union ships present in the sector or not. Since each algorithm needs to know this information we can calculate it *before* we jump into the algorithm. In our routines we calculate a number of these variables:

FLAGS

F1 Are there Union ships in the current sector?
   0 - NO
   1 - YES
F2 Is the current ship cloaked?
F3 Is the ship badly damaged?

VARIABLES

TG Targeted ship in the Active Ship List (like SH except used for the target)
RA Range to the targeted ship

The algorithms share several options: effect repairs, seek enemy sector, run away, cloak ship, uncloak ship, close in, fire phasers, and launch torpedo. To avoid repeating code (and to save wear and tear on our fingers), we'll create common routines to take care of all these options, then just GOTO those routines when we need them.

But wait—there's a catch. Three of those options (close in, fire phasers, and launch torpedo) depend on variables which we have not calculated yet. What happens if we GOTO these routines like the others and they fail? Say there are no torpedoes left. What should the launch torpedo routine do? Here's an idea: what if we set up the routine for a GOSUB statement so that when the routine fails it just RETURN's to the caller, and when it succeeds it takes over control and continues? Then all we would have to do is set up our algorithm so that the statement after the GOSUB takes care of any failures. Sounds good, but one problem remains: how do we make the computer "forget" that we GOSUB'd into the routine? You'll notice that we included a small machine language routine in the listing to do this for us, and this routine is called a "Pop". By the way, this Pop can be used by any BASIC v2 program.

Let's take a look at how all of this pre-planning will help (please see AL DESTROYER/FRIGATE

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- Modified Version in the ALGORITHM CHART). Notice how the routine is smaller and less complex. Now check the modified versions of the algorithms in the BASIC listing (Lines 25100 to 25499). These complex algorithms have been reduced to just a few lines of code each.

ROUTINES

Line	Routine Name
20800	Wait
26000	Run away
26100	Effect repairs
26300	Launch torpedo if possible (Pop)
26400	Fire phasers if possible (Pop)
26500	Steal energy
26600	Cloak ship
26800	Uncloak ship
26900	Close in (Pop)
27000	Seek enemy sector

Gene's Mistake

Take a look at line numbers 21155 and 21160 from last issue's program listing:

```
21155 forxi=Øtons-1:ifsl%(xi,9)=xtthen21165
21160 next:goto21135
```

The problem here is subtle. This loop cycles through the ships in the Active Ship List until it finds the ship xt. If the loop finishes, then it did not find the ship xt and it goes to line 21135. However, If the loop finds the ship xt it exits the loop and goes to line 21165. Here lies the problem. BASIC never finishes the FOR NEXT loop; so BASIC continues to look for a NEXT statement after we're long gone. If this happens too many times, we will eventually get an ?OUT OF MEMORY ERROR and our program will crash. The best solution is to always end a FOR/NEXT loop with a NEXT statement. Let's look at this issues solution:

```
21150 x1=999
21155 forxi=nutons-1:ifsl%(xi,9)=xtthenx1=xi:
xi=ns-1
21160 next:ifx1=999then21135
```

These three lines accomplish the same thing. In line 21155, once we find the ship xt, we store the ship's index in x1 and set xi to ns-1 which ends the loop. The difference here is that we make sure we'll always end the FOR/NEXT loop with a NEXT statement.

MAIN PROGRAM (New/changed sections since the last issue)

Lines 1ØØ-199 (setup main game loop)
- Comments now say "starship combat part iii"

Lines 2ØØ-299 (main loop for the game)
- moved NU calculation to the game initialization routine

SUBROUTINES (New/changed sections since the last issue)

Lines 1Ø4ØØ-1Ø699 (game initialization routines)
- Lines 1Ø4ØØ-1Ø499 reduced initial number of torpedoes for several ships
- Lines 1Ø8ØØ-1Ø9Ø2 added cloak field to the Active Ship List array SL%
- Lines 1Ø9Ø7-1Ø915 relocated NU calculation from Lines 2ØØ-299
- Lines 1Ø92Ø-1Ø949 cloaks all Alliance ships equipped to do so
- Lines 1Ø975-1Ø999 implements machine language Pop for GOSUB's

Lines 11ØØØ-11999 (initialize all ships for next round)
- now restores ten percent of shield strength

Lines 114ØØ-11699 (update status and map area for current ship)
- Lines 14ØØ-1499 checks if stats must be displayed (by using UP)
  UP Ø - no update at all
  1 - complete update stats and map
  2 - update map area only
- Lines 15ØØ-1599 checks if map must be displayed and if so displays only uncloaked ships

Lines 118ØØ-11999 (kill ship)
- updated so that it copies the new cloak field in the Active Ship List (field ten)
- updates NU if necessary

Lines 2ØØØØ-24999 (process Union ship turn)
- Lines 2ØØØØ-2ØØ74 sets new UP variable for calls to update routine
- Lines 2ØØ75-2Ø199 uses better method for the FOR NEXT loop and enables sector scanners through the use option
- Lines 2Ø255-2Ø299 updates stats and clears option area
- Lines 2Ø7ØØ-2Ø799 updated so you can only view enemy ships in the same sector unless you have a Deep Scanner; and you can't view cloaked enemy ships
- Lines 211ØØ-21199 uses better method for the FOR NEXT loop and does not allow targeting of cloaked enemy ships
- Lines 22ØØØ-22Ø99 displays sector map depending on the type of scanner aboard

Lines 25ØØØ-29999 (process Alliance ship turn)
- Lines 25ØØØ-25Ø99 calculates all necessary variables for the algorithms
- Lines 251ØØ-25199 process turn for a Hunter (Hunter algorithm)
- Lines 252ØØ-25299 process turn for a Destroyer/Frigate (Destroyer/Frigate algorithm)
- Lines 253ØØ-25399 process turn for a L-Cruiser (L-Cruiser algorithm)
- Lines 254ØØ-25499 process turn for a H-Cruiser (H-Cruiser algorithm)
- Lines 26ØØØ-26Ø99 run away routine
- Lines 261ØØ-26199 effect repairs routine (not implemented)
- Lines 263ØØ-26399 launch torpedo subroutine (Pop routine)
- Lines 264ØØ-26499 fire phasers subroutine (Pop routine)
- Lines 265ØØ-26599 steal energy routine
- Lines 266ØØ-26699 cloak ship routine
- Lines 267ØØ-26799 two second delay subroutine
- Lines 268ØØ-26899 uncloak ship routine
- Lines 269ØØ-26999 close in subroutine (Pop routine)
- Lines 27ØØØ-27Ø99 seek enemy sector routine
- Lines 271ØØ-27199 find best union ship routine (used for calculating TG and RA)

Entering the Program

Before entering this month's installment, load and run the CHK-LIST utility (located elsewhere in this issue). Once you have CHK-LIST loaded and ready, load your saved copy of Starship Combat from last issue. The listing in this issue only gives lines which have been added or altered. Finally, before you begin to add the new lines from this issue, there are a few lines which must be deleted from your previous version. You may remoe these lines by typing the line numbers, one by one, folowing easch with a press of the <RETURN> key. Here are the lines to delete:

2Ø725 25Ø75 25Ø8Ø25155 2516Ø 25165 2517Ø 25175 2518Ø
25285 2519Ø 25195 25365 2537Ø

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STARSHIP COMBAT

```
82d4 115 rem starship combat part iii
978f 10445 data "UN Scout",3,500,50,65,0,0,4,
     0,5,999,999
18e8 10450 data "UN L-Dest",4,750,80,100,1,0,
     7,0,2,6,999
df28 10455 data "UN Destroy",4,850,100,140,1,
     1,6,0,3,4,5
3af6 10460 data "UN Cruiser",6,1000,200,300,2
     ,1,10,1,3,5,6
bcc5 10465 data "UN Battle",5,1250,225,500,3,
     2,8,1,3,5,6
d695 10475 data "AL Destroy",4,725,75,100,4,4
     ,4,0,4,999,999
a5ef 10480 data "AL Frigate",5,800,90,150,5,4
     ,7,1,4,7,999
8893 10485 data "AL LCruise",7,900,150,250,6,
     5,6,1,3,4,5
309c 10490 data "AL HCruise",6,1100,200,400,6
     ,6,8,1,3,5,999
3f54 10815 dimsl%(24,10)
2406 10848 : sl%(sk,10)=0:sk=sk+1:goto10835
c243 10907 rem-
ecae 10909 rem setup initial # of un ships
08b2 10911 rem-
294c 10913 nu=0:forxi=0tons-1:ifsl%(xi,0)<utt
     hennu=nu+1
3730 10915 next
af50 10920 rem-
4b4c 10922 rem cloak alliance ships
65a1 10924 rem-
e82d 10926 forxi=nutons-1
b117 10928 : xt=0:forxj=7to10:ifty%(sl%(xi,0)
     ,xj)=4thenxt=1
4739 10930 : next
451b 10932 : sl%(xi,10)=xt
9fa3 10934 next
662e 10975 rem-
f01b 10977 rem setup pop for gosubs
b778 10979 rem-
9ae5 10980 forxi=830to852:readxt:pokexi,xt:ne
     xt
d1e3 10982 data104,104,169,255,133,74,32,138,
     163,201,141
b35b 10984 data240,3,76,224,168,232,232,232,2
     32,232,154,96
81e9 10990 return
0979 11030 : xt=ty%(sl%(xi,0),2)
51c7 11035 : xl=int(.10*xt)+sl%(xi,6)
b520 11040 : ifxl>xtthenxl=xt
6216 11045 : sl%(xi,6)=xl
3331 11050 next
9845 11055 return
761e 11432 ifup=0thenreturn
e68c 11523 ifsl%(xi,10)=0thenpoke1024+5*40+12
     +sl%(xi,3)*40+sl%(xi,2),sl%(xi,9)+193
1405 11525 next
9baa 11530 ifup=1thenxt=1024+5*40+12+sl%(sh,3
     )*40+sl%(sh,2):pokext,peek(xt)-128
5481 11535 return
37eb 11860 ifxk<nuthennu=nu-1
dc56 11862 ns=ns-1:ifns=1thenreturn
e16a 11865 ifxk=nsthenreturn
735e 11875 : forxj=0to10:sl%(xi-1,xj)=sl%(xi,
     xj):next
2f7d 20030 up=1:gosub11400:up=2
3fa4 20100 pw=sl%(sh,5):xt=999
ba3d 20105 forxi=1toop:ifxx$=op$(xi-1)thenxt=
     xi:xi=op
d1e9 20107 next:ifxt=999then20090
9e5c 20110 onxtgoto20200,20300,20400,20500,22
     000,20090,20800,20600,20900,21400
```

STARSHIP COMBAT *(cont.)*

```
e96d 20280 gosub11200:gosub11300:return
2b9c 20715 xt=asc(xx$)-asc("A"):xl=999
3d25 20720 forxi=0tons-1:ifsl%(xi,9)=xtthenxl
     =xi:xi=ns-1
458e 20721 next:ifxl=999then20075
4c2e 20722 ifxl<nuthen20730
724f 20724 ifty%(sl%(sh,0),7)=1then20728
a8db 20726 ifsl%(xl,1)<>sl%(sh,1)then20075
2518 20728 ifsl%(xl,10)=1then20075
abb3 20730 sh=xl:up=1:gosub11400
1c0d 21150 xt=asc(xx$)-asc("a"):xl=999
727b 21155 forxi=nutons-1:ifsl%(xi,9)=xtthenx
     l=xi:xi=ns-1
be29 21160 next:ifxl=999then21135
d7f3 21165 tg=xl:ifxz<>sl%(tg,1)then21135
0742 21170 ifsl%(tg,10)=1then21135
6f55 22000 rem-
d363 22005 rem display sector map
6f55 22010 rem-
f5e2 22015 gosub11300
3919 22020 xt=ty%(sl%(sh,0),7)
5b64 22025 ifxtthenprint"Deep Scanner":goto22
     035
b4c3 22030 print"Scanner"
485d 22035 printoa$"{2 CRSR DN}(press a key)"
c090 22040 print"{HOME}{5 CRSR DN}{WHT}";:xs=
     10:xs$="{12 CRSR RT}{RVS ON}----------"+
     chr$(13):gosub10200
f374 22045 forxi=0tons-1
ee8b 22050 : xx=sl%(xi,1):xy=0
04a4 22055 : ifxx>9thenxx=xx-10:xy=xy+40:goto
     22055
ddea 22057 : xl=1024+5*40+12+xx+xy:xz=peek(xl
     )
383a 22060 : ifxi<nuor(xt=landsl%(xi,10)=0)th
     enxz=sl%(xi,9)+193:goto22070
31c7 22065 : ifsl%(xi,10)=0thenxz=170
3df1 22070 : pokexl,xz
b628 22075 next
62f1 22080 xx=sl%(sh,1):xy=0
31ab 22085 ifxx>9thenxx=xx-10:xy=xy+40:goto22
     085
359c 22090 xz=1024+5*40+12+xx+xy
ddcf 22092 pokexz,peek(xz)-128
8bfc 22094 getxx$:ifxx$=""then22094
dc31 22096 return
8575 25020 rem set common var's & flags
414d 25030 xz=sl%(sh,1):xx=sl%(sh,2):xy=sl%(s
     h,3)
338c 25035 mp=sl%(sh,4):pw=sl%(sh,5)
bb2c 25040 up=0:f2=sl%(sh,10)
8669 25045 f1=0:xl=999:forxi=0tonu-1:ifsl%(xi
     ,1)=xzthenxl=0:xi=nu-1
9708 25047 next:ifxlthen25060
e75a 25050 f1=1:gosub27100
e3c5 25055 iff2=0thenup=1:gosub11400:up=2
c27d 25060 iff2thenpw=pw-1:ifpw<=0thenpw=1
7430 25065 f3=0:if(sl%(sh,6)+sl%(sh,7))<(.33*
     ty%(sl%(sh,0),3))thenf3=1
5db7 25070 on(sl%(sh,0)-4)goto25100,25200,252
     00,25300,25400
a3a9 25105 rem hunter logic
d473 25115 iff1then25130
e6e5 25120 : iff3then26100
1424 25125 : goto27000
2bb2 25130 iff3then26000
4f79 25135 ifpw<100then26500
292c 25140 ifra<7thengosub26300
bf67 25145 gosub26400
c648 25150 goto26500
c7c6 25200 rem-
```


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STARSHIP COMBAT *(cont.)*

```
2284 25205 rem destoryer/frigate logic
c7c6 25210 rem-
a674 25215 iff1then25235
e348 25220 : iff3then26100
5a63 25225 : iff2then27000
d115 25230 : goto26600
a6c6 25235 iff3then26000
7c9e 25240 iff2then25260
a0c1 25245 : ifra<9thengosub26300
7a81 25250 : gosub26400
be50 25255 : goto26600
35d9 25260 ifmp>2then26800
5497 25265 gosub26900
e749 25270 goto20800
a9a9 25305 rem 1-cruiser logic
b42a 25315 ifsl%(sh,8)=0then25200
807c 25320 iff1=0then25220
e669 25325 iff3then26000
5fde 25330 iff2then25345
2384 25335 : ifra<7thengosub26300
3799 25340 : goto26600
6baf 25345 ifra>4thengosub26900
f76a 25350 ifmp>4then26800
d142 25355 gosub26900
5045 25360 goto20800
9e6a 25400 rem-
4b41 25405 rem h-cruiser logic
eb51 25410 rem-
c3c7 25415 iff1=0then27000
c9eb 25420 ifsl%(sh,8)=0then25445
0daa 25425 : ifra<5thengosub26300
da1b 25430 : gosub26400
f39b 25435 : gosub26900
f328 25440 : goto20800
c30f 25445 gosub26400
9b21 25450 goto20800
42aa 26000 rem-
bbeb 26005 rem run from enemy in same sect
42aa 26010 rem-
fc81 26015 xt=0:forxi=7to10:ifty%(sl%(sh,0),x
     i)=4thenxt=1
c509 26017 next
803e 26018 ifxt=0then26030
fed9 26020 : iff2then26045
64a9 26025 : goto26600
6af1 26030 gosub11300:printty$(sl%(sh,0))
e88f 26035 printoa$"{CRSR DN}runs!"
b623 26040 gosub26700
ab09 26045 x1=xy:if(xz-10)<0thenx1=999
dc40 26050 x2=9-xy:if(xz+10)>99thenx2=999
67db 26055 x3=xx:ifright$(str$(xz),1)="0"then
     x3=999
f3d8 26060 x4=9-xx:ifright$(str$(xz),1)="9"th
     enx4=999
1d5b 26065 ifx1<x2andx1<x3andx1<x4then20200
57a7 26070 ifx2<x3andx2<x4then20500
d990 26075 ifx3<x4then20300
8627 26080 goto20400
e6c7 26100 rem-
387d 26105 rem effect repairs
e6c7 26110 rem-
72e5 26115 goto20800:rem wait for now
bf6b 26300 rem-
7b4e 26305 rem fire torpedo if possible
ca50 26310 rem-
3939 26315 ifsl%(sh,8)=0thenreturn
a04a 26320 xt=ty%(sl%(sh,0),5)
f77d 26325 rp=tp%(xt,0):rm=tp%(xt,1)
ab4d 26330 tl=sl%(sh,8)-1
ea67 26335 dm=tp%(xt,3)-(ra*tp%(xt,2)):ifdm<0
     thendm=1
```

STARSHIP COMBAT *(cont.)*

```
10b6 26340 ifrp>pwthenreturn
c751 26345 ifrm>mpthenreturn
009f 26350 gosub11300
02ca 26355 printy$(sl%(sh,0))
9712 26360 printoa$"{CRSR DN}launches a"
625c 26365 printoa$"{2 CRSR DN}torpedo!"
8b97 26370 gosub26700
cf19 26375 sys830:goto21200
590d 26400 rem-
8184 26405 rem fire phaser if possible
590d 26410 rem-
813e 26415 xt=ty%(sl%(sh,0),4)
cf88 26420 rp=ph%(xt,0):rm=ph%(xt,1)
40fa 26425 dm=ph%(xt,2):tl=sl%(sh,8)
1d19 26430 ifrp>pwthenreturn
2c72 26435 ifrm>mpthenreturn
b793 26440 gosub11300
f767 26445 printy$(sl%(sh,0))
2621 26450 printoa$"{CRSR DN}fires his"
5e7a 26455 printoa$"{2 CRSR DN}disruptors."
6a0a 26460 goto26370
93fc 26500 rem-
9e77 26505 rem steal energy from target
93fc 26510 rem-
3b24 26515 gosub11300
c208 26520 printy$(sl%(sh,0))
0fac 26525 printoa$"{CRSR DN}creates an"
517e 26530 printoa$"{2 CRSR DN}energy field."
c329 26535 gosub26700
f847 26540 xt=sl%(tg,5)-25:ifxt<=0thenxk=sh:g
     osub11800:goto26550
f9f8 26545 sl%(tg,5)=xt
8936 26550 xt=pw+10:ifxt>ty%(sl%(sh,0),1)then
     xt=ty%(sl%(sh,0),1)
b6c1 26555 pw=xt:goto20800
3791 26600 rem-
e9d4 26605 rem cloak ship
2c36 26610 rem-
1147 26615 iff1=0then26635
3bcf 26620 gosub11300:printty$(sl%(sh,0))
6fec 26625 printoa$"{CRSR DN}cloaks!"
fd5d 26630 gosub26700
e351 26635 sl%(sh,10)=1:goto20800
1690 26700 rem-
3727 26705 rem 2 sec delay
0d37 26710 rem-
d53a 26715 forxi=0to2000:next:return
a95a 26800 rem-
0602 26805 rem uncloak ship
a95a 26810 rem-
e040 26815 sl%(sh,10)=0
3fa1 26820 iff1=0then26840
7195 26825 gosub11300:printty$(sl%(sh,0))
a57e 26830 printoa$"{CRSR DN}uncloaks!"
97fc 26835 up=1:gosub11400:up=2
1ef4 26840 goto20800
549b 26900 rem-
7faa 26905 rem close in on tg if possible
549b 26910 rem-
b8ed 26915 ifra<2thenreturn
0762 26920 iff2then26940
d9ff 26925 gosub11300:printty$(sl%(sh,0))
7b60 26930 printoa$"{CRSR DN}closes."
3f5b 26935 gosub26700
175a 26940 sys830
1b41 26945 zx=xx-sl%(tg,2):zy=xy-sl%(tg,3)
7209 26950 ifabs(zx)>abs(zy)then26965
b36f 26955 : ifzy<0then20500
67be 26960 : goto20200
7f7c 26965 ifzx<0then20400
91a5 26970 goto20300
```


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STARSHIP COMBAT *(cont.)*

```
f0f6 27000 rem-
2e66 27005 rem move towards best union ship
85cd 27010 rem-
492f 27020 x1=-1:xt=999:forxi=0tonu-1:ifsl%(x
     i,0)>x1thenx1=sl%(xi,0):xt=xi
4aae 27025 next
3d3a 27030 x1=xz:y1=0
dd3c 27035 ifx1>9thenx1=x1-10:y1=y1+1:goto270
     35
21b9 27040 x2=sl%(xt,1):y2=0
d530 27045 ifx2>9thenx2=x2-10:y2=y2+1:goto270
     45
9f85 27050 ifabs(x1-x2)>abs(y1-y2)then27065
5023 27055 : ifxz<sl%(xt,1)then20500
b891 27060 : goto20200
8eba 27065 if(x1-x2)<0then20400
6818 27070 goto20300
3a07 27100 rem-
ae22 27105 rem id best union ship in sector
21a0 27110 rem-
8390 27115 xt=-1:tg=999:forxi=0tonu-1
dac3 27120 ifsl%(xi,1)=xzthenifsl%(xi,0)>xtth
     enxt=sl%(xi,0):tg=xi
8bc3 27125 next
d6d7 27130 ra=int((((xx-sl%(tg,2))^2)+((xy-sl
     %(tg,3))^2))^.5)
cb47 27135 return
```

IMPORTANT NOTE

Don't forget to SAVE this version of Starship Combat to disk with a new name!

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ADVANCED TECHNIQUES

by Gene Barker

Do you want to auto-boot your Commodore 64 machine language (ML) programs like the pros? In this edition of Advanced Techniques we'll show you how. Even more, we'll give you a small BASIC program to do all of the work for you! Let's go.

```
LOAD"Ø:*",8,1
```

You've seen this command before; it almost seems magical with some programs. This one-line command loads and executes all sorts of commercial programs. The question is, "How does it work?" The "Ø:*" string tells the drive that we want the first file in the directory. Let's assume that the first file is named BOOT. BOOT is a small ML program who's job is to load and execute another ML program. The ",8" tells BASIC to load BOOT from drive number eight (8), and the ",1" tells BASIC to place BOOT at its original memory location.

Okay, once we load the BOOT file, how does BASIC know to RUN it? This is the key to auto-booting a program on the Commodore 64. The BOOT file is strategically placed in memory in such a way that it *redirects* where BASIC should go after it executes the LOAD command. Here is how BOOT sits in memory:

BOOT Memory Map ($Ø2A7-$Ø3Ø3)

$Ø2A7 ML BOOT Program. Just does a simple load of the main ML program and JMP's to it.
$Ø2CC Free bytes (for extra BOOT instructions).
$Ø2ED Length of ML program filename.
$Ø2EE Filename of ML program to be loaded and executed.
$Ø3ØØ BASIC Error message vector (should always be $E38B).
$Ø3Ø2 BASIC Main program loop vector. Set to our BOOT program at $Ø2A7, then **reset** at the conclusion of BOOT to $A483.

After BASIC finishes loading BOOT, it jumps through BASIC's main program loop vector located at $Ø3Ø2-$Ø3Ø3. Our BOOT program has this vector set to itself at $Ø2A7. BOOT then loads the ML program, resets the vector back to $A483, then JMP's to the ML program we loaded. That's all there is to it!

The BASIC program Autoboot 64 will create this BOOT program for you. All you have to do is type in a filename for the ML program you wish to boot, and a filename for the BOOT file itself. Autoboot 64 will do the rest. Be aware that Autoboot 64 requires that the ML program it's supposed to boot be present on the current device in the current directory.

This auto-booting method is well known, and you are free to use Autoboot 64 to create auto-boots for your own programs (commercial included).

NOTE: *See our CHK-LIST utility (located elsewhere in this issue) for information on entering programs and using the checksum values in the left column.*

AUTOBOOT 64

```
5ØØØ  1ØØ REM--------------------------------
6DC2  1Ø5 REM COMMODORE WORLD MAGAZINE
3Ø14  11Ø REM ADV TECHNIQUES W/GENE BARKER
F87D  115 REM AUTOBOOT 64
ØE6B  12Ø REM
1A27  125 REM (C)1994 CREATIVE MICRO DESIGNS
92AD  13Ø REM--------------------------------
1315  135 REM-
5E64  14Ø REM GET BOOT FILE INFO
C243  145 REM-
9DB3  15Ø PRINT
53A2  155 PRINT"COMMODORE WORLD AUTOBOOT 64"
E7B9  16Ø PRINT"{CRSR DN}ENTER NAME OF ML FILE
       TO BOOT:"
1A11  165 INPUT FL$
3BØ8  17Ø PRINT"ENTER NAME FOR BOOT FILE:"
C6D1  175 INPUT BF$
C1CC  2ØØ REM-
FB21  2Ø5 REM ASK USER IF INFO IS CORRECT
DA6B  21Ø REM-
74ØA  215 PRINT"{CRSR DN}CREATE BOOT FILE:{RVS
       ON}"BF$
45Ø5  22Ø PRINT"FOR ML FILE:{RVS ON}"FL$
1373  225 PRINT"{CRSR DN}ARE YOU SURE (Y/N)?"
543E  23Ø GET X$
933D  235 IF X$="N" THEN END
311E  24Ø IF X$<>"Y" THEN 23Ø
7A39  245 PRINT"{CRSR DN}WORKING..."
5291  3ØØ REM-
529A  3Ø5 REM GET STARTING ADDRESS FROM
839Ø  31Ø REM ML FILE
F573  315 REM-
8Ø22  32Ø DV=PEEK(186)
6Ø5E  325 AD$=FL$+",P,R"
3C18  33Ø OPEN2,DV,2,AD$
DFF4  335 GET#2,A$,B$
A8D1  34Ø A=ASC(A$+CHR$(Ø)):B=ASC(B$+CHR$(Ø))
268E  345 CLOSE2
83C7  4ØØ REM-
A55F  4Ø5 REM PLACE BOOT FILE DATA INTO ARRAY
83C7  41Ø REM-
64AF  415 AS=94:DIM FA$(AS)
98FC  42Ø FOR I=Ø TO AS
489E  425 : READ X
8A75  43Ø : FA$(I)=CHR$(X)
8Ø5A  435 NEXT I
27AA  5ØØ REM-
A168  5Ø5 REM CUSTOMIZE BOOT FILE FOR THE
C745  51Ø REM ML FILE
D9E4  515 REM-
```


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AUTOBOOT 64 *(cont.)*

```
D4D4 520 FA$(37)=CHR$(A):FA$(38)=CHR$(B)
595A 525 FA$(72)=CHR$(LEN(FL$)+2)
B188 530 FOR I=1 TO LEN(FL$)
F9E9 535 : FA$(74+I)=MID$(FL$,I,1)
D5B9 540 NEXT I
DA6B 600 REM-
4EAD 605 REM WRITE OUT BOOT FILE
C1CC 610 REM-
E703 615 BF$=BF$+",P,W"
0DF0 620 OPEN2,DV,2,BF$
A404 625 FOR I=0 TO AS
4E98 630 : PRINT#2,FA$(I);
E786 635 NEXT I
1231 640 CLOSE2
8146 645 PRINT"{CRSR DN}DONE!"
0000 650 END
7E06 700 REM-
220F 705 REM ML AUTOBOOT CODE $02A7-$0303
0B3D 710 REM-
D6AA 715 DATA 167,2:      REM START=$02A7
E46C 717 :
ACCD 718 :                REM SET DEVICE
E46C 719 :
1606 720 DATA 169,1:      REM 02A7 LDA #$01
E100 725 DATA 166,186:    REM 02A9 LDX $BA
1F7D 730 DATA 160,1:      REM 02AB LDY #$01
0144 735 DATA 32,186,255:REM 02AD JSR $FFBA
38AC 737 :
2B62 738 :                REM SET NAME
38AC 739 :
3194 740 DATA 173,237,2: REM 02B0 LDA $02ED
9BA9 745 DATA 162,238:    REM 02B3 LDX #$EE
2BBD 750 DATA 160,2:      REM 02B5 LDY #$02
494A 755 DATA 32,189,255:REM 02B7 JSR $FFBD
A70F 757 :
2E99 758 :                REM LOAD FILE
A70F 759 :
F80F 760 DATA 169,0:      REM 02BA LDA #$00
C51B 765 DATA 32,213,255:REM 02BC JSR $FFD5
A70F 767 :
ADE3 768 :                REM RESET VECTOR
1630 769 :
927E 770 DATA 162,131:    REM 02BF LDX #$83
3A11 775 DATA 160,164:    REM 02C1 LDY #$A4
B1ED 780 DATA 142,2,3:    REM 02C3 STX $0302
00FF 785 DATA 140,3,3:    REM 02C6 STY $0303
5553 787 :
AD35 788 :                REM START ML PRG
8993 789 :
1B31 790 DATA 76,0,0:     REM 02C9 JMP $????
6263 792 :
556B 793 :                REM 02CC FREE AREA
6263 794 :
6463 795 DATA 0,0,0,0,0,0,0,0,0,0,0
3A13 800 DATA 0,0,0,0,0,0,0,0,0,0,0
7956 805 DATA 0,0,0,0,0,0,0,0,0,0,0
CAF0 807 :
08E3 808 :                REM 02ED FNAME LEN
1630 809 :
53B5 810 DATA 0
FDC0 812 :
40C3 813 :                REM 02EE FILE NAME
FDC0 814 :
2CF2 815 DATA 48,58
F6A2 820 DATA 0,0,0,0,0,0,0,0
60A2 825 DATA 0,0,0,0,0,0,0,0
5553 827 :
140E 828 :                REM BASIC VECTORS
8993 829 :
12C5 830 DATA 139,227:    REM 0300 $E38B
178C 835 DATA 167,2:      REM 0302 $02A7
```


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Peripheral Vision

By Mark Fellows

SCSI MAGIC: THE SEARCH FOR ERRORS

In the last issue of Commodore World, we showed you how to implement the CMD HD's "Send SCSI" command to read and write specific logical blocks on the CMD HD. We also mentioned presenting a sample program in this installment, but we've got a little too much ground to cover on how to identify and handle SCSI errors (should they occur), so that sample program will have to wait until next time.

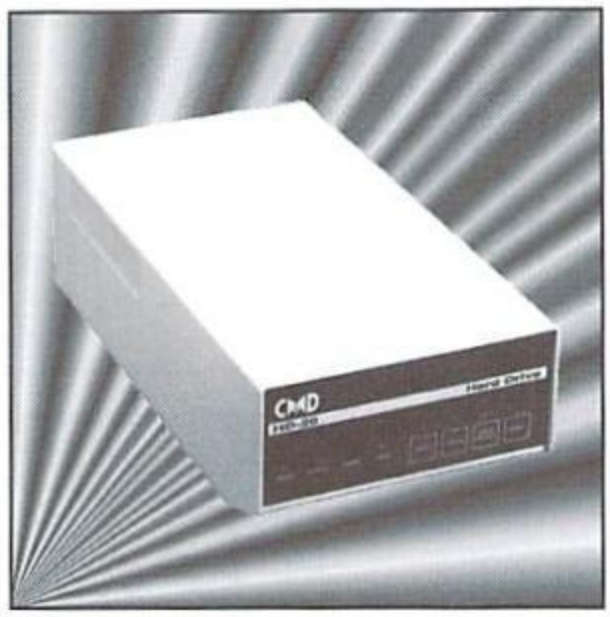
Error Checking - Why Bother?

I know you're probably anxious to get on with things and put together a working program. But remember, error checking and handling is a part of every well-designed program—and it's much easier to design your program with error checking in mind than to tack it on as an afterthought. Besides, if an error does happen to occur, you're going to want to know about it immediately, not two weeks later when you try to restore from the incomplete copy that your program created because it ignored a Seek Error.

A single subroutine can check for and report any errors that may occur. Because the errors reported by SCSI devices are detailed and specific, you will find that they can help you determine whether your drive mechanism has a mechanical problem, if there's a bad spot on the recording media, or if (heaven forbid) your program is sending invalid commands, addresses or parameters to the HD.

How, When, and What to Check

Always check for an error after each SCSI command. The HD makes this easy—simply read a single status byte from the error channel after sending the "S-C" command. You can easily add a GOSUB that calls your error checking routine:




```
PRINT#15,"S-C"CHR$(Ø)CHR$
(Ø)CHR$(48)CHR$(37)CHR$(Ø
)CHR$(Ø)CHR$(Ø)CHR$(Ø)CHR
$(1)CHR$(Ø)CHR$(Ø)CHR$(1)
CHR$(Ø):GOSUB2ØØØØ
```

The error routine at line 20000 would first read the status byte, convert it to a number and place it in the variable E, as shown below:

```
GET#15,E$:E=ASC(E$+CHR$(Ø))
```

At this point, you can look at the value of E and determine whether or not an error has occurred. Unless your program or the HD has gone totally haywire, you will see one of six possible values:

ØØ **OK.** The command was successful.

Ø2 **Check condition.** An error occurred. You must request further status from the drive to determine the exact nature of the error.

Ø8 **Target busy.** The SCSI device is busy. You will not normally see this error because the HD will not accept another "S-C" command until the previous one has completed.

16 **Intermediate status OK.** Returned after the successful completion of each command in a series of linked commands; a rarely-used feature of SCSI devices which is beyond the scope of this article.

24 **Reservation conflict.** Returned if you try to access a logical unit (LUN) reserved to another SCSI device. Should never occur on the HD.

48 **DOS Syntax Error.** The syntax of the "S-C" command is incorrect.

Asking for Trouble

You will normally see only three of the errors: 00 (everything is OK), 48 (go back and work on your program), and 02 (you need to find out what went wrong during the last command). To handle the latter, we must issue the *Request Sense* command. This allows us to read a sequence of *Sense Bytes* that give us specific information about the exact nature of the error. The Command Descriptor Block (CDB) for the Request Sense command is:

Request Sense Command

Byte \ Bit	7	6	5	4	3	2	1	0
0	Operation Code							
1	LUN			Reserved				
2	Reserved							
3	Reserved							
4	Allocation Length							
5	Control Byte							

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Since we've covered CDB's thoroughly in previous installments, we'll get right to work building our command. First we need to specify the SCSI device number (usually 0) and the address of a buffer within the HD to hold the error information (called *sense data*). We'll use the same buffer address as we did in the last issue: $3000. This means that we can now build the first part of the 'S-C' command:

```
PRINT#15,"S-C"CHR$(Ø)CHR$
(Ø)CHR$(48)
```

Of course, we still need to tack on the Request Sense CDB: Byte 0, the opcode for Request Sense, is 02; Byte 1, LUN and reserved bits, is 00; Bytes 2 & 3 are reserved and are 00; while Byte 5, the control byte, is also 00. We've saved Byte 4, the allocation length, for last because it needs special mention. If the allocation length is set to 00, then the SCSI device will return error information in the form of *Nonextended* sense data. If the allocation length is non-zero, then the device returns *Extended* sense data.

Nonextended sense is a holdover from the earliest SCSI specification, and provides only a limited amount of error information. For this reason, you should always request extended sense data. Extended sense returns up to 27 bytes of error information. In order to keep things simple and to make sure all pertinent information is returned, always set the allocation length (Byte 4) to 27.

Okay, now that we know what values belong in the CDB, we're ready to finish our command:

```
PRINT#15,"S-C"CHR$(Ø)CHR$
(Ø)CHR$(48)CHR$(2)CHR$(Ø)
CHR$(Ø)CHR$(Ø)CHR$(27)CHR
$(Ø):GOSUB2ØØØØ
```

As with any other command, follow it with the GOSUB to your status checking routine. Although not much can go wrong with the Request Sense command, you will know right away if you've somehow made a mistake in the command syntax.

Getting the Bad News

After we've sent the Request Sense command, our buffer at $3000 in the HD will contain all the infornmation we need to know about the cause of the last error. The first thing to do is to send a Memory-Read command to the HD and then pull all 27 bytes into an array. The syntax for the Memory-Read command is:

```
PRINT#lf,"M-R",CHR$(bl)CH
R$(bh)CHR$(nb)
```

Set *lf* to 15, because that's our command channel. *Bl* and *bh* are the low and high bytes of the memory address in the HD where the sense data is located. In our example, we are using address $3000, which gives us a low address byte of $00 (decimal 0) and a high address byte of $30 (decimal 48). *Nb* specifies the number of bytes that we want, which in this case is 27. Therefore, our Memory-Read command is:

```
PRINT#15,"M-R"CHR$(Ø)CHR$
(48)CHR$(27)
```

Once we've sent the command, we need to fill our array. The 27 bytes are retrieved one-at-a-time over the command channel by using the GET# command within a FOR...NEXT loop which fills the integer array SB%:

```
FORI=ØTO26:GET#15,B$:B=AS
C(B$+CHR$(Ø)):SB%(I)=B:NE
XT
```

Before we begin interpreting the sense data, lets take a look at the format of the 27 bytes we've just received.

Extended Sense Data

Byte \ Bit	7	6	5	4	3	2	1	0
0	AV	Error Class			Error Code			
1	Reserved							
2	Reserved				Sense Key			
3	Logical Block Address (MSB)							
4	Logical Block Address							
5	Logical Block Address							
6	Logical Block Address (LSB)							
7	Additional Sense Length							

AV (Address Valid): When this bit is set (equal to one), it indicates that Bytes 3-6 specify the logical block address associated with the error.
Error Class/Error Code: For extended sense, the error class is always 7 (bits 4,5 & 6 set), while the error code is always 0 (bits 0,1,2 & 3 clear).
Sense key: Contains a number from 0 -15 which can be used as a key for the grouping of errors. See the list of sense keys at the end of this article.
Logical Block Address (LBA): When the AV bit is set, Bytes 3-6 indicate the logical sector associated with the specific error.
Additional Sense Length: Indicates the number of additional sense bytes associated with the error. For most errors, the additional sense length is 14, and the additional sense bytes are defined as :

Additional Sense Bytes

8	Reserved
9	Reserved
10	Reserved
11	Reserved
12	Additional Sense Code
13	Reserved
14	Reserved
15	Reserved
16	Reserved
17	Retry Count
18	Physical Cylinder (MSB)
19	Physical Cylinder (LSB)
20	Physical Head
21	Physical Sector

Additional Sense Code: Defines the specific error that occurred.
Retry Count: Indicates the number of retries that were required in the case of recovered errors
Physical Cylinder, Head, Sector: Defines the physical sector where the error occurred.

In the case of a usage counter overflow (sense code=$80), the additional sense length will be set to 19, with Bytes 18-26 containing the current values of the usage counters as shown below:

Sense Bytes for Usage Counters

18	Blocks Read (MSB)
19	Blocks Read
20	Blocks Read (LSB)
21	Seeks (MSB)
22	Seeks
23	Seeks (LSB)
24	Uncorrected Read Errors
25	Recoverable Errors
26	Seek Errors

The usage counters provide diagnostic information compiled since the last power-on and are cleared after being reported.

Crunching the Numbers

Now that we've got all the error information stored in our array, we can begin to separate the various elements and find out exactly what

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happened. First, lets get the sense key and assign it to a varialbe. The sense key is located in the lower four bits of Byte 2, so we need to AND that byte with 15 like this:

```
SK%=SB%(2)AND15
```

A list of the various sense keys is provided at the end of this article. Next, we need to get the specific error code, AKA the 'additional sense code' located in Byte 12. This is even easier:

```
SC%=SB%(12)
```

Now, if the AV (Address Valid) bit is set, we will probably want to know the logical block address (LBA) where the error occurred. You can test the AV bit by looking at array element SB%(0) and seeing if it is greater than 127. If it is, then the LBA given in Bytes 3-6 is valid. We can then calculate and assign the LBA to a variable:

```
LB%=SB%(3)*65536*65536+SB
%(4)*65536+SB%(5)*256+SB%
(6)
```

Well, now you've got the basic information you need in order to detect, report, and possibly correct errors. Of course, you will have to tailor your error subroutine to provide these functions within your program. In the next issue, SCSI Magic will not appear in this column, since Jim Butterfield will be taking over as the resident Peripheral Visionary. But we will indeed continue elsewhere in the pages of Commodore World.

Sense Keys

SCSI sense keys provide an error grouping capability to aid in determining possible corrective actions.

Sense Key	Description
ØØ ($ØØ)	**No Sense:** There is no specific sense key information to be reported.
Ø1 ($Ø1)	**Recovery Error:** The last command was completed successfully, with some error recovery action performed. Details can be determined by examing sense data.
Ø2 ($Ø2)	**Not Ready:** The drive cannot be accessed.
Ø3 ($Ø3)	**Medium Error:** Command failed due to a non-recoverable error, probably caused by a flaw in the media or error in the recorded data.
Ø4 ($Ø4)	**Hardware Error:** The drive detected a non-recoverable hardware failure.
Ø5 ($Ø5)	**Illegal Request:** There was an illegal parameter in the command descriptor block (CDB) or in the additional parameters.
Ø6 ($Ø6)	**Unit Attention:** A SCSI reset occurred since the last command was executed.
Ø7 ($Ø7)	**Data Protect:** Not supported by most SCSI devices.
Ø8 ($Ø8)	**Blank Check:** Not supported by most SCSI devices.
Ø9 ($Ø9)	**Vendor-Unique:** Reserved, vendor-specific.
1Ø ($ØA)	**Data Protect:** Not supported by most SCSI devices.
11 ($ØB)	**Aborted Command:** The command was aborted before completion.
12 ($ØC)	**Equal:** Not supported by most SCSI devices.
13 ($ØD)	**Volume Overflow:** Not supported by most SCSI devices.
14 ($ØE)	**Miscompare:** Not supported by most SCSI devices.
15 ($ØF)	Reserved

Sense Codes

The following list provides a description of the most common error codes. For a complete listing of all codes supported by a particular drive mechanism, you must consult the manufacturer's programming manual for the specific SCSI device.

Sense Code	Description
ØØØ ($ØØ)	There is no error to be reported
ØØ1 ($Ø1)	No index/sector signal
ØØ2 ($Ø2)	No seek complete
ØØ3 ($Ø3)	Write Fault
ØØ4 ($Ø4)	Drive not ready
ØØ6 ($Ø6)	No Track Ø found
Ø16 ($1Ø)	ID CRC or ECC error
Ø17 ($11)	Unrecovered read error
Ø18 ($12)	No address mark found in ID field
Ø19 ($13)	No address mark found in data field
Ø2Ø ($14)	No record found
Ø21 ($15)	Seek positioning error
Ø23 ($17)	Recovered read data with retries
Ø24 ($18)	Recovered read data with ECC
Ø25 ($19)	Defect list error
Ø26 ($1A)	Parameter overrun
Ø28 ($1C)	Primary defect list not found
Ø3Ø ($1E)	Recovered ID with ECC correction
Ø32 ($2Ø)	Invalid operation code
Ø33 ($21)	Illegal logical block address (LBA)
Ø36 ($24)	Illegal field in CDB
Ø37 ($25)	Invalid LUN
Ø38 ($26)	Invalid field in parameter list
Ø41 ($29)	Power-on or SCSI bus reset occurred
Ø42 ($2A)	Mode select parameters changed
Ø5Ø ($32)	No defect spare available
Ø64 ($4Ø)	RAM Failure
Ø66 ($42)	Power-on diagnostic failure
Ø68 ($44)	Internal controller error
Ø69 ($45)	Select/reselect failed
Ø7Ø ($46)	Unsuccessful soft reset
Ø71 ($47)	SCSI bus parity error
Ø72 ($48)	Initiator detected error
128 ($8Ø)	Overflow on Usage Counter error

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How to Type In Program Listings Appearing in Commodore World

While *Commodore World* currently doesn't make it a habit of publishing type-in programs, a number of our columns do require entering sample routines. For this purpose, we have created our CHK-LIST utility for the Commodore 64 and 128. This utility uses a 16-bit CRC checksum method to verify that you have correctly entered each program line, and that each of the characters in the program lines are in the correct order.

You'll notice that program listings appear with a column of values to the left of the program lines. These values are the CHK-LIST values and are not to be entered as part of the program. A similar set of values are generated by the CHK-LIST utility to allow you to verify that everything has been entered correctly.

Enter the CHK-LIST program from BASIC. You can use either a C-64 or a C-128 computer. If you use a C-128, it can be in either 64 or 128 mode. Be sure to enter each line carefully to avoid mistakes—until you actually have CHK-LIST working, finding errors in program entry won't be easy. After you have finished entering the program, be sure to SAVE a copy to disk before you attempt to RUN it, just in case. If you aren't familiar with how to save a program to disk, you can use the following command:

```
SAVE"CHK-LIST",8
```

CHK-LIST

```
A454  10 F=ABS(PEEK(65533)=255):M=49152:IFFTHE
      NM=4864
6E2F  12 C=Ø:PRINT"{CLR/HOME}WORKING";
E35Ø  2Ø READD:IFD=-256THEN4Ø
AD2Ø  3Ø C=C+D:IFD<ØANDF=ØTHEN2Ø
3316  31 IFD<ØTHEND=Ø-D:M=M-1
Ø7FØ  32 POKEM,D:M=M+1:PRINT".";:GOTO2Ø
578A  4Ø PRINT:READCK:IFC<>CKTHENPRINT"ERROR I
      N DATA STATEMENTS!":END
Ø679  5Ø PRINT"DONE.":END
8D92  6Ø :
E7FE  49152 DATA 165,43,-45,133,251,165,44,-46
      ,133,252
B2AE  49160 DATA 169,Ø,141,36,193,-2Ø,169,147,
      32
CD5Ø  49168 DATA 21Ø,255,32,194,192,-19,16Ø,Ø,
      14Ø
C9CD  49176 DATA 37,193,-2Ø,177,251,133,253,2Ø
      8,3
2Ø58  49184 DATA 238,37,193,-2Ø,2ØØ,177,251,13
      3,254
EA9C  49192 DATA 2Ø8,3,238,37,193,-2Ø,173,37,1
      93,-2Ø
6C15  492ØØ DATA 2Ø1,2,2Ø8,1,96,2ØØ,177,251
E7ØE  492Ø8 DATA 17Ø,2ØØ,177,251,32,2Ø5,-5Ø,18
      9,-142,169
6795  49216 DATA 6,133,211,-236,169,61,32,21Ø,
      255
F8ØF  49224 DATA 169,32,32,21Ø,255,16Ø,2,177
9735  49232 DATA 251,32,213,192,-19,2ØØ,177,25
      1,32
Ø734  49240 DATA 213,192,-19,2ØØ,177,251,24Ø,6
      ,32
D99D  49248 DATA 213,192,-19,76,9Ø,192,-19,173
      ,191,192,-19
AC3Ø  49256 DATA 32,167,192,-19,173,19Ø,192,-1
      9,32,167
```

To use CHK-LIST, load it into your computer and type RUN. Make sure that any program you are currently working on is saved first, or start CHK-LIST before you begin typing in a new program. After you have CHK-LIST in memory and running, type NEW. You may now either load or begin typing the program you wish to have CHK-LIST check on. Whenever you want to check your program, type in the appropriate SYS command given below:

C-64 or C-128 in 64 mode:	`SYS49152`
C-128 in 128 mode:	`SYS4864`

Note that when typing in listings, some special characters will appear in braces. For example, {CLR/HOME} means that you should enter the Clear key, which is done by holding down the SHIFT key while you press the HOME key. Other times you may see a number ahead of the key name, such as {3 SPACES} or {5 CRSR L}. This means you should press the key indicated the number of times shown. Most special keys are easy to identify, since the text shown will generally match the text on the key. Exceptions are the space bar {SPACE}, and cursor keys which include directions ({CRSR UP}, {CRSR DN}, {CRSR L} and {CRSR RT}). Be sure to use the correct key combinations for color keys, such as <CTRL><2> for {WHT}.

CHK-LIST *(cont.)*

```
B343  49264 DATA 192,-19,169,13,32,21Ø,255,165
      ,253
DF3A  49272 DATA 133,251,165,254,133,252,238,3
      6
A6E2  4928Ø DATA 193,-2Ø,173,36,193,-2Ø,2Ø1,2Ø
      ,24Ø,3
936E  49288 DATA 76,18,192,-19,162,Ø,189,1,193
      ,-2Ø
8C3A  49296 DATA 24Ø,6,32,21Ø,255,232,2Ø8,245,
      32
EB74  493Ø4 DATA 228,255,2Ø1,13,2Ø8,249,32
6Ø95  49312 DATA 228,255,2Ø8,251,76,8,192,-19,
      72
AØØ1  4932Ø DATA 1Ø6,1Ø6,1Ø6,1Ø6,32,18Ø,192,-1
      9,1Ø4
FAA2  49328 DATA 32,18Ø,192,-19,96,41,15,17Ø,1
      89
EBFD  49336 DATA 2Ø,193,-2Ø,32,21Ø,255,96,Ø,Ø
E9Ø7  49344 DATA Ø,Ø,169,Ø,141,19Ø,192,-19,141
E8EA  49352 DATA 191,192,-19,169,33,141,192,19
      2,-19,169
A7D7  4936Ø DATA 16,141,193,192,-19,96,162,8,7
      2
6Ø4Ø  49368 DATA 41,127,77,191,192,-19,141,191
      ,192,-19
D24B  49376 DATA 24,14,19Ø,192,-19,46,191,192,
      -19,144
D52F  49384 DATA 18,173,192,192,-19,77,19Ø,192
      ,-19,141
DCA6  49392 DATA 19Ø,192,-19,173,193,192,-19,7
      7,191,192,-19
6Ø32  494ØØ DATA 141,191,192,-19,1Ø4,1Ø,2Ø2,2Ø
      8,215
37C5  494Ø8 DATA 96,13,8Ø,82,69,83,83,32
9A2A  49416 DATA 6Ø,82,69,84,85,82,78,62
AC9Ø  49424 DATA 13,13,13,Ø,48,49,5Ø,51
FE71  49432 DATA 52,53,54,55,56,57,65,66
Ø17E  4944Ø DATA 67,68,69,7Ø,Ø,Ø,-256,37944
```


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Carrier Detect

By Les Songa

A PRIMER FOR OFF-LINE MAIL READING

Since this issue is dedicated to the subject of telecommunications, I thought I'd cover a topic that involves both on-line time and off-line time. Many people, until they try it, are intimidated by the terms used and the variety of programs that are used in conjunction with off-line mail reading. Thus, I'll illustrate why reading mail this way is convenient by taking a look at the alternative; then I'll explain what off-line mail reading is and show you the steps involved.

On-line Reading

When I bought my first modem, I spent hours tying up my phone line calling bulletin boards, playing games, downloading files and participating in the message areas. There's something very exciting about reading someone else's comments, then responding with ideas and opinions of your own... and then coming back later to read responses to your own posts.

Most systems are arranged so that messages about one topic are separated from messages on other topics. This makes it easy to find others who enjoy similar interests to share ideas with. You may get new information, and sometimes argue over the finer points of your mutual interest. It's fun, addicting, and—time consuming.

The time aspect of romping around bulletin boards and responding to messages, or just enjoying them from an interested third party point of view, is important in a couple of different ways. When you log onto to a BBS, unless you've been given some kind of super SysOp status, you usually have a set amount of time available on the system. There's also only 24 hours in a day, during which you are usually expected to eat, sleep and work; this often comes in direct conflict with your on-line time. Reading mail off-line allows you to have a life while still keeping up with the messages on the bulletin boards. It also means you can use more of your on-line time doing other things. Not to mention the fact that when you read mail off-line, more people can call the bulletin board—and that keeps the SysOp happy.

Off-line Reading

Off-line mail reading involves calling the BBS, downloading a packet which has all the messages in it from areas that you select. Once off-line, you use a program or two to "process" the messages. Then you can read the messages and reply to them just as if you had called the BBS and went into the message base to do the same thing. When you're done, if you've created any replies, you "pack" these into a single file to upload to the BBS. The system you call processes this file, and puts each message into the appropriate area.

First Things First

Before you can consider reading mail off-line, you'll need to obtain an off-line mail reader (OLR from here on) first, such as QWKie for the C-64 or QWKRR128 for the C-128. QWKRR128 was reviewed in a previous issue of *Commodore World*, so I'll concentrate most of my comments on using QWKie instead. Check the sidebar for a list of files you can download that are either necessary or helpful for mail reading. Along with the OLR, you'll need a utility to dissolve mail packets; these packets are compressed by the mail door, and must be "unpack" or dissolved before the OLR can read the messages. One file that both 64 and 128 users may need is CSX01.SDA, which is used by other files mentioned in the sidebar.

To make things easy on yourself, I suggest setting up a work disk with the OLR program (and any files it must have to operate), and the program(s) you will be using to dissolve your mail with. If you only have one disk drive, you should download your mail packet onto this disk. If you have more than one disk drive, you can download your mail packet to one disk drive, and have your work disk in another.

Mail Door Options

Once you have an OLR and a program to handle unpacking the mail, you can download your first mail packet. Call the BBS, and find the mail door. Commodore OLR's, at this point in time, are QWK packet mail readers, so if you are asked by the mail door what style of mail packet you wish to receive, be sure to select "QWK", or a "QWK" mail door. Before downloading a packet, you will need to tell the mail door how you want your messages and how you want to receive it. One of the first considerations is how the mail is packed. The program mentioned above, CSX01, allows us Commodore users to dissolve files which are compressed using the MS-DOS ARC format. Using other programs, we can also make use of PKZIP 1.02 files, although many bulletin boards only offer PKZip 2.04g, which as yet, there aren't any programs available that will let us dissolve these. ARC, or PKARC is probably the most commonly available "Compression" or "packer" for mail doors, and if you're not sure which version of PKZip the door uses, this is the safest choice. How much mail can you handle? Most, but not all, mail doors offer a couple of choices on how much mail you wish to receive at a time. This is an important consideration, especially if you have a

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single 1541 or 1571 disk drive. Because you'll need room on the disk for other files involved, it's probably best to err on the safe side rather than risk not having enough disk space to read your mail. For 1541 users, I recommend setting up so you will receive a maximum of 100 messages per packet; 1571 users can probably handle up to about 300 messages in a packet.

Other mail door options include whether or not to include bulletins, news, and other text files. Whether you select to download these depends on the amount of disk space you have, and whether you have an interest in reading these. You may also have a prompt to select the protocol you wish to use when transferring mail. Another option involves whether the CONTROL.DAT file should be small or large; answer with "small". If you are using QWKie for your OLR, select yes to include ".NDX" files in your mail packet.

Naturally, you won't want to download all the mail from the BBS, so most mail doors allow you to select only those conferences you wish to receive mail from. Some allow extra options, such as the ability to download only messages to you, or to download all messages from a conference. What you select here is up to you, how much time you have to read mail, and of course, how much disk space you have available.

Now you can download your mail packet, and on future calls to the bulletin board, you will not need to change your settings again unless you decide you want to change something you've previously set. The mail door saves your preferences for you, as well as keeps track of messages that you've already downloaded.

Dissolving Your Mail

Which program to use to dissolve your mail with depends upon which method of compression you chose for your QWK packet. QPX and QPX64, along with QWKIE.DE-ARC, included with QWKie, all dissolve mail that was compressed with PKARC, using CSX01. Unless you're using QWKIE.DE-ARC, you won't actually "see" CSX01 in use, but without this utility program on the same disk with the dissolver program, you won't be able to dissolve your PKARCed mail packets. C-64 users can also use QPE to dissolve PKARCed mail, or if you've downloaded a ZIPped mail packet, you can use UNZIP64.

Regardless of which program you use, be sure to read the documentation for the program before using it. This would also be a good time to read the instructions that come with the OLR program. The only real way to learn how to use the programs are to use them, but you will be way ahead of the crowd if you read and have the documentation right next to you as you use the OLR. After awhile, it becomes "old hat", but until then, keep the instructions nearby so you can look up anything that seems confusing.

Follow the instructions with the program you are using to dissolve the mail packet, and begin the process of unpacking your mail. When finished, you will have a MESSAGES.DAT, CONTROL.DAT, and possibly some other files on your disk, such as the above mentioned .NDX files and news or bulletin files. When the mail packet is dissolved, if you've used QPE, QPX or QPX64, the off-line mail reader program will load automatically if you've placed it on the same disk as you've specified when you run the program. Otherwise, you will have to load the OLR separately.

Once the OLR is loaded, you will probably need to tell it which disk drive, and or CMD directory it will find the mail packet files in and which drive or directory it should write your replies to. You may also need to set the date and time. Using QWKie, when you select to read your mail, there is a short delay while the program accesses and indexes the mail packet. When finished, you are presented with a menu listing the conferences you selected to read mail from before downloading your mail packet. If you have personal mail and a "PERSONAL.NDX" file was dissolved in your mail packet, QWKie also has a menu option to read your personal mail.

At this stage, you simply read the messages, and answer them just as you do on the BBS, with the exception that you have more time to word your replies, or to look up information, save or print messages of interest, and you have the ability to quit reading and come back to it later.

Once finished reading and replying to mail, you will need to "pack" up your replies to upload back to the BBS mail door. If using QWKie either select the built in option to ZIP replies, or quit the program and run the external ZIP program to pack your replies for you. Most BBS mail doors will allow you to download your mail in ARC format and upload your replies in ZIP format without a hitch. It should be noted that the ZIP format used does not actually compress the reply packet, it simply stores it in a PKZIP format the BBS can recognize. Now you can load your term program, call the BBS, and upload your replies. The mail door will dissolve the .REP packet and just like a post office, will sort your mail and put it in the conferences, just as if you had created your replies on-line.

That's all there is to off-line mail reading. While reading your mail off-line, your phone is free so you can call and order pizza, you can stop to eat your dinner, or if you're a true mail addict, eat your pizza while reading your mail. If something comes up and you have to do something else, you can quit and come back to it later. The first few times you read mail off-line, it might seem complicated, but once you become familiar with the programs used, it becomes almost second nature.

But watch out for "creeping conference-ism", a condition known to off-line mail addicts who find themselves with extra time after beginning to read mail off-line, so they add more message conferences to their mail packets. This causes them to once again complain of lack of time, due wholly to their mail addiction—don't say I didn't warn you!

Off-line Mail Readers & Utilities

Mail Readers

QWKie V3.1 C-64 Offline Mail Reader by Arthur Moore, Shareware, $17.00 (US), $19.00 (INTL). Filename: QWKIE31U.SDA

QWKRR V4.30 C-128 Offline Mail Reader by Rod Gasson, Shareware, $15 (US), $20 (AUST) Filenames: QWKRR43.TXT, QWKRR43A.SFX, QWKRR43B.SFX, and QWKRRUT.SFX

Mail Dissolving Utilities

CSX01.SDA (or.SFX) by Chris Smeets. Required for any 64 or 128 utility which dissolves PKARCed mail.

QPX64.SDA by Russell Prater. For C-64 users. Dissolves PKARCed QWK mail packets and loads QWKie.

UNZIPV10.SFX by Bill Lucier. For C-64 users. May also be named UNZIPV101.SFX. Dissolves mail packets ZIPped with PKZIP 1.02. Does NOT dissolve ZIPs created with PKZIP 2.04g.

NZP12813.SFX by David Schmoll. 128 unZIP program which performs the same function as UNZIPV10.SFX, above. Included with this is another utility named QPE.

QPE by David Schmoll. For 64 or 128 users. A utility included with NZP12813.SFX. Dissolves either ZIP'ed or ARC'ed QWK packets and loads the offline mail reader. Requires CSX01.SDA for PKARCed mail packets. In 64 mode, it will not unZIP QWK packets, but will unARC instead, and load QWKie. In 128 mode, it will either unZIP or unARC the mail packet and then load QWKRR128.

QPX by Russell Prater and Rod Gasson. QWK Packet Extractor. Dissolves PKARC mail packets. Requires CSX01. Included in QWKRRUT.SFX file.

QPA by Russell Prater and Rod Gasson QWK Packet Archiver. Included in QWKRRUT.SFX file. PKARC (stores) reply packets for upload to mail doors that will not accept ZIPped packets.

QWKIE.DE-ARC by Arthur Moore Included in QWKIE31U.SDA. Dissolves PKARCed mail packets. Requires CSX01.

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GEOS 101, GEOS 102 & GEOS 103

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Input/Output

Commodore guru Jim Butterfield takes up residence as our Peripheral Visionary, and in his first column he explains how input becomes output.

GUI's: A Sticky Mess?

Over the Edge returns with a vengence, and in our GEOS issue it *dares* to decry the benefits of Graphical User Interfaces!

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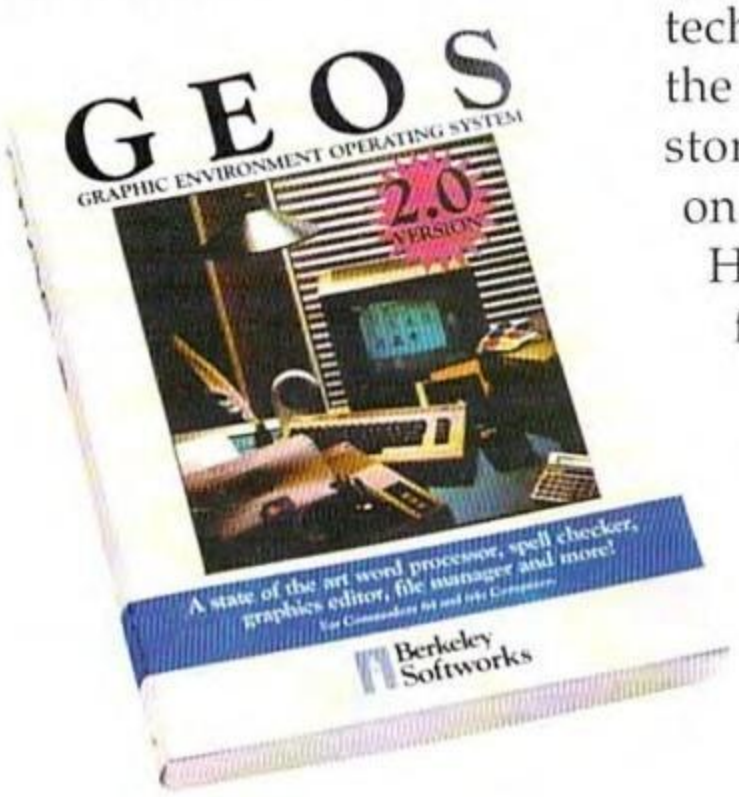
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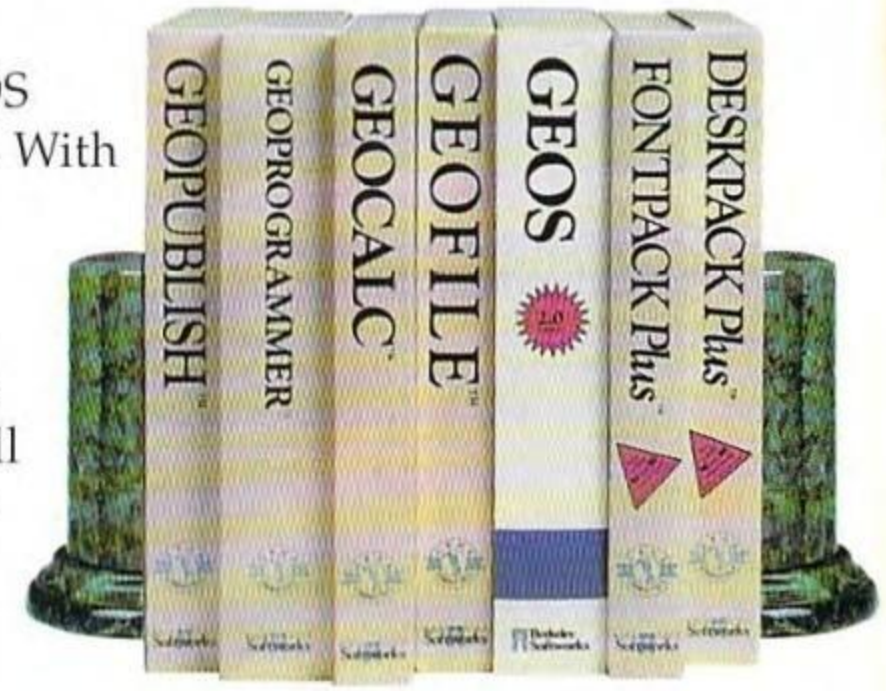

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